OVERSIGHT OF THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (SUPERFUND)

HEARING

BEFORE THE

SUBCOMMITTEE ON
ENVIRONMENTAL POLLUTION

OF THE

COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

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OVERSIGHT OF THE COMPREHENSIVE ENVIRONMENTAL, RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (SUPERFUND)

WEDNESDAY, AUGUST 4, 1982

U.S. Senate,
Committee on Environment and Public Works,
Subcommittee on Environmental Pollution,
Washington, D.C.

The subcommittee met at 9:30 a.m., in room 4200, Dirksen Senate Office Building, Hon. John H. Chafee (chairman of the subcommittee) presiding.

Present: Senators Chafee, Stafford, Symms, Randolph, Mitchell, and Moynihan.

Also present: Senator D'Amato.

Senator Chafee. Good morning.

This will be an oversight on the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, Superfund, so-called.

We are delighted that the distinguished chairman of the committee is here, and I know he has other engagements. Senator Stafford, perhaps you would like to deliver an opening statement at this time.

Senator Stafford. Thank you very much, Mr. Chairman.

OPENING STATEMENT OF HON. ROBERT T. STAFFORD, U.S. SENATOR FROM THE STATE OF VERMONT

Senator Stafford. What I would really like to do is stay here because of my intense interest in the Superfund legislation we adopted in the last Congress and in this oversight hearing. But unfortunately some 2 months ago I agreed to chair a hearing of a subcommittee on another important matter. I had hoped to be able to remain here to make certain points during the question and answer period.

Since I am unable to stay, please allow me instead to merely state them.

I am proud of the role which the other members of this committee and I played in the enactment of the Superfund law. It is the first entirely new environmental law to be enacted since the mid-seventies.

It contains several innovative and, I believe important provisions. To be blunt, my fear is that those provisions may be lost during the implementation process. Provisions for which I am especially concerned are as follows: First, the breadth of the Superfund law. The law does not deal only with hazardous waste sites. It deals with releases of hazardous substances regardless of source. The hazardous substance can be released in a smoke stack, a discharge pipe, an overturned tank car, or from brown paper bags. The overwhelming amount of hazardous substances now present in the environment did not orginiage from hazardous waste disposal but from other releases. It is imperative that the law be fully implemented and frankly, the mind set of those now implementing the law is on hazardous waste, not hazardous substances, or so it appears to me.

For example, I see no mention, however casual, in the national contingency plan to releases of hazardous air pollutants or toxic water pollutants or the application of pesticides although these constitute the major sources of a wide variety of chemicals ranging from DDT to PCB's.

Second, I am concerned that the health authorities are not being adequately implemented. Dr. Brandt mentions the fact that five or six health studies are now under way at Superfund sites. What is not mentioned is that all of these studies were begun before the Superfund law was enacted. I see no indication that responses to releases include threshold determinations of exactly what, if any, health response is required. Nor do I see any indication that the Department is taking seriously the congressional conclusions implicit in the enactment of the Superfund law that diseases caused by toxic chemicals pose a potentially enormous risk to this Nation.

Disease registries have not been established. Literature surveys are not completed. Health surveys have not been undertaken.

Third, Mr. Chairman, I am concerned about the state of Superfund lawsuits. I am not referring to hazardous waste enforcement, but the collection of costs under the law's liability provisions in the common law. I am aware that some fund costs have been recaptured but a statement establishes no legal precedent or settlement, establishes no legal precedent whatever. An essential component of the Superfund law is the idea that those who traffic in dangerous chemicals will exercise greater care if they know they will be held strictly liable for the injuries they cause. The imposition of that liability requires lawsuits to be filed and litigated.

Although I have not checked recently as of 2 months ago no new lawsuits had been actually filed under Superfund by the Federal Government. Ironically the only plaintiff to have availed itself of the law's liability provisions this spring was the city of Philadelphia, not the Federal Government.

Finally, I am especially concerned that the law is being viewed as a bricks and mortar public works law, not a flexible emergency response mechanism. The law envisions a response which, like the justice of the Lord, is swift. It was envisioned to be oriented to the needs of humans and the environment, yet the emphasis of the national contingency plan and other implementing documents is on State matching shares.

I have many other concerns and questions, but for now I will have to, Mr. Chairman, submit those in writing and I appreciate your courtesy in letting me go ahead.

Senator CHAFEE. Senator, we appreciate a great deal your coming and, of course, any questions you have for the witnesses we will submit if you would let us know. We will see that those appear.

OPENING STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

Senator **Chafee**. I want to say we welcome everyone here to this continuing oversight into the implementation of the Superfund as it is commonly referred to.

As you all know, we worked in this committee for some 3 years to enact the Superfund law in an effort to address the very real threat to the public health and welfare of this Nation posed by improper disposal and handling of hazardous waste. We are all anxious to find that hazardous waste sites are being cleaned up, health studies are underway, enforcement actions are being filed, hazardous spills are being contained and the hazardous waste problem is significantly improving.

The Comprehensive Environmental Response, Compensation and Liability Act of 1980 was adopted more than a year and a half ago. Like any new act, there are criticisms. Most often cited is that the cleanup of the hazardous waste sites is proceeding too slowly.

I have got to say in defense of the agency that those sites which I am familiar with, the agency has been very responsive and has moved swiftly. These aren't easy problems. But nonetheless there have been criticisms of the way the cleanup has proceeded in other areas. We are holding these hearings today to find out exactly what progress is being made in implementing all provisions of the fund.

We have witnesses from the key Federal agencies involved, the EPA, the Department of Health and Human Services, Coast Guard, Department of Justice, Department of Interior. We also have witnesses from the Environmental Community, the regulated industries and the States to give their perspective on the successes or the deficiencies of the program.

This is an oversight hearing. What we are doing is monitoring how things are going under the act.

Along with this oversight hearing my distinguished colleagues from New York have asked that we address the recent release of the EPA monitoring study regarding the Love Canal area and the subsequent determination that homes outside the canal area are habitable. Criticism and concerns have been raised regarding the validity of the study and the involvement of EPA, Department of Health and Human Services and the National Bureau of Standards and how they reached the decision that they did.

There are a number of staff here to answer questions in connection with that study, and we are delighted to welcome Senator D'Amato to our hearing, who, I am sure, will have questions in connection with that.

I want to state to all present that I am personally committed to make every effort to insure that all components of the Superfund program work effectively and efficiently while meeting the objectives of the act. We have got to work together to find solution to what probably is the most serious environmental problem of this decade, namely, hazardous waste sites and spills. So in the course of the testimony, I would hope that the witnesses would not only delineate their successes and point out their achievements but also point out the problems and how we in this committee might be helpful to you.

Ms. Lavelle, we want to hear from you as to what you think we might be able to do better and how, in some respects, the law might be amended if, in your judgment, it is so required.

So we will proceed with the hearings now.

We are really going to have to move rather crisply today.

As I understand it, there is going to be a vote at 12 o'clock but that is the start of a series of votes. Whether there will be votes in between or whether those stack votes might come at 11:30 a.m. and with the principal vote at 12, I don't know. But it would be very helpful to know. But in any event, I am going to have to hold the witnesses right down to summarizing their statements if they are long.

Senator D'Amato, we welcome you here and look forward to what you have to say.

OPENING STATEMENT OF HON. ALFONSE M. D'AMATO, U.S. SENATOR FROM THE STATE OF NEW YORK

Senator D'AMATO. Thank you very much, Mr. Chairman.

I would first of all like to thank you, express my appreciation on behalf of the people of our State in particular, in, one, holding this most important hearing and second for providing us an opportunity to ask some questions and make some observations in regard to the EPA study conducted at Love Canal in New York.

I had urged the subcommittee to investigate the Environmental Protection Agency's Love Canal monitoring report in order to examine the process by which EPA and the Department of Health and Human Services reached their conclusion that the Love Canal declaration area was habitable.

Unfortunately, the decisionmaking process which produced this conclusion raises serious questions about the report's credibility. The irresponsible manner in which these agencies acted in reaching the conclusion of habitability of the Love Canal declaration area is incredible. Furthermore, the presentation to Congress and the public was handled in such a way that no one, least of all those who live in the Love Canal area, knows who to believe.

To follow the chronology of events leading to the release of the report is to follow a path of flip-flopping, carelessness and bureaucratic pressure.

The Love Canal environmental monitoring study was to be released in December 1980. What delayed the study's release for 19 months? One can only hypothesize or speculate that it took all that time to get the bureaucracies together, speaking with one voice. Did EPA reach tentative conclusions during that period which changed before the final release of the report?

What pressure was brought to bear on the Department of Health and Human Services and the National Bureau of Standards so that a conclusion of habitability could be reached?

I would like to just depart from the prepared text to outline the chronology. October 1981, HHS believes that the declaration area was habitable. May 1982, NBS determines that EPA testing procedure might be inadequate. June 14, 1982, EPA in response to a letter from Senator Stafford, this committee, and Senator Moynihan said that the report would be released in 30 days. June 15, the following day, HHS reverses itself and says on the basis of NBS's criticism that the area could not be held to be habitable or the conclusion could not be reached. July 8, 1982, big meeting, EPA, HHS, and NBS come together to review NBS's criticism and the next day NBS turns around and says that they generally tested in acceptable manners. July 13, the day before the report HHS reverses itself once again and says the area is habitable.

What incredible finding, incredible in light of the fact that 7 of the 11 scientists hired by HHS to conduct the reports and review come to different conclusions, 7 out of the 11 hired by HHS say they would not recommend people could move back into that area. They would not approve the testing procedures. Seven out of the 11 ain't bad if they say move in. But 7 out of 11 isn't good when they say don't. What does HHS do? How do they come to this incredible conclusion? How can Congress, least of all, how can or most of all the people of that region of the area, or this Nation, put its trust in the Environmental Protection Agency, its findings, its decisions if this is the kind of manner in which they make reports and conclusions to deal with the life and health of its citizens?

I am not suggesting that the area is habitable. I am not suggesting that it is not habitable but I am suggesting that after spending $5 million or $4.5 million, after going through an exercise of months and months and months, after having had this committee finally force you to come out with a report, that this is certainly totally inadequate and shocking.

I would also indicate, because I will make the request of the Inspector General, to get down to the specifics as to what happened at that meeting at July 8. Who was there? What pressures were exerted, how did we have an agency flipping and flopping and how is it that HHS comes down with the decision that flies in the face of its own experts that it brought in? I am going to ask that my remarks be submitted for the record.

I think you would find if you report some of those remarks, it is rather shocking when toxicologists, outstanding professors, et cetera, indicate quite clearly, 7 out of 11 of them that they would not and could not recommend that this area be habitable, that the conclusion and testing procedures would be safe for habitability.

Thank you very much, Mr. Chairman.

[Senator D'Amato's complete statement follows:]

8/4/82

STATEMENT
BY
SENATOR ALFONSE D'AMATO
BEFORE THE
SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION
ON
LOVE CANAL

MR. CHAIRMAN, I WOULD LIKE TO THANK YOU FOR HOLDING THIS HEARING AND FOR THE OPPORTUNITY TO PARTICIPATE TODAY.

I HAD URGED THIS SUBCOMMITTEE TO INVESTIGATE THE ENVIRONMENTAL PROTECTION AGENCY'S LOVE CANAL MONITORING REPORT IN ORDER TO EXAMINE THE PROCESS BY WHICH E.P.A. AND THE DEPARTMENT OF HEALTH AND HUMAN SERVICES REACHED THEIR CONCLUSION THAT THE LOVE CANAL DECLARATION AREA WAS HABITABLE.

UNFORTUNATELY, THE DECISION MAKING PROCESS WHICH PRODUCED THIS CONCLUSION RAISES SERIOUS QUESTIONS ABOUT THE REPORT'S CREDIBILITY. THE IRRESPONSIBLE MANNER IN WHICH THESE AGENCIES ACTED IN REACHING THE CONCLUSION OF HABITABILITY OF THE LOVE CANAL DECLARATION AREA IS INCREDIBLE. FURTHERMORE, THE PRESENTATION TO CONGRESS AND THE PUBLIC WAS HANDLED IN SUCH A WAY

THAT NO ONE, LEAST OF ALL THOSE WHO LIVE IN THE LOVE CANAL AREA, KNOWS WHO TO BELIEVE.

TO FOLLOW THE CHRONOLOGY OF EVENTS LEADING TO THE RELEASE OF THE REPORT IS TO FOLLOW A PATH OF FLIP-FLOPPING, CARELESSNESS AND BUREAUCRATIC PRESSURE.

THE LOVE CANAL ENVIRONMENTAL MONITORING STUDY WAS TO BE RELEASED IN DECEMBER 1980. WHAT DELAYED THE STUDY'S RELEASE FOR NINETEEN MONTHS? ONE CAN ONLY HYPOTHESIZE OR SPECULATE THAT IT TOOK ALL THAT TIME TO GET THE BUREAUCRACIES TOGETHER, SPEAKING WITH ONE VOICE. DID E.P.A. REACH TENTATIVE CONCLUSIONS DURING THAT PERIOD WHICH CHANGED BEFORE THE FINAL RELEASE OF THE REPORT?

WHAT PRESSURE WAS BROUGHT TO BEAR ON THE DEPARTMENT OF HEALTH AND HUMAN SERVICES AND THE NATIONAL BUREAU OF STANDARDS SO THAT A CONCLUSION OF HABITABILITY COULD BE REACHED?

WHY DID H.H.S. REVERSE ITSELF TWICE ON THE DETERMINATION OF HABITABILITY, THE SECOND REVERSAL COMING ONLY HOURS BEFORE THE RELEASE OF THE REPORT?

IN ADDITION, SEVEN OF THE ELEVEN SCIENTISTS RETAINED BY H.H.S. TO STUDY E.P.A.'S FINDINGS IN AUGUST 1981, CRITICIZED THE REPORT AND FELT ITS DATA WERE INADEQUATE TO DETERMINE WHETHER THE DECLARATION AREA WAS HABITABLE.

ACCORDING TO DR. STEVEN AUST OF THE UNIVERSITY OF MICHIGAN, IN THE REPORT "THERE ARE MANY EXAMPLES OF VERY POOR SCIENCE....LACK OF ADEQUATE EXPLANATIONS."

DR. RICHARD BROWNER OF THE GEORGIA INSTITUTE OF TECHNOLOGY CONCLUDED THAT "THERE REMAINS A LINGERING CONCERN THAT MUCH OF THE INFORMATION CONTAINED IN THE REPORT IS NOT FULLY CLARIFIED AT THIS TIME."

DR. BEVERLY PAIGEN, ANOTHER ONE OF THE CONSULTANTS HIRED BY H.H.S., STATED THAT "I AM NOT COMFORTABLE AS A SCIENTIST IN ANSWERING QUESTIONS CONCERNING PUBLIC HEALTH BASED ON SUCH DATA."

THE VERY CONSULTANTS RETAINED BY THE FEDERAL GOVERNMENT TO REVIEW

THE LOVE CANAL DATA RESPONDED TO THE FEDERAL GOVERNMENT THAT THE DATA WERE INADEQUATE TO REACH A CONCLUSION THAT THE LOVE CANAL DECLARATION AREA WAS HABITABLE. HOW THEN, DID H.H.S. CONCLUDE THAT THE AREA WAS SAFE? WHY SHOULD THE FEDERAL GOVERNMENT CONSULT WITH SUCH SCIENTISTS IF THEIR CONCLUSIONS ARE TO BE DISCARDED?

THE ENVIRONMENTAL PROTECTION AGENCY IS CHARGED WITH ENSURING A CLEAN AND HEALTHY ENVIRONMENT FOR ALL AMERICANS, TO REGULATE AND RESTRICT DISCHARGES OF POLLUTANTS INTO OUR AIR, WATER, AND SOIL, AND TO PROTECT AND PROMOTE A HEALTHY ENVIRONMENT. CONGRESS HAS GIVEN THE E.P.A. BROAD ENFORCEMENT POWERS TO ACCOMPLISH THESE GOALS. HOWEVER, IN CARRYING OUT ITS TASKS, IT IS ESSENTIAL THAT THE AMERICAN PEOPLE HAVE FAITH AND CONFIDENCE THAT THE STEPS E.P.A. TAKES TO PROTECT THE ENVIRONMENT ARE PROPER AND PRUDENT.

ACCORDINGLY, THE RESIDENTS OF THE LOVE CANAL AREA MUST BELIEVE THAT THE E.P.A. REPORT CONCLUDING THAT THE DECLARATION AREA IS HABITABLE IS ONE IN WHICH THEY CAN HAVE CONFIDENCE. HOWEVER, THE MANNER IN WHICH THE E.P.A. RELEASED THIS REPORT, AND THE INDECISION SURROUNDING THE CONCLUSION THAT THIS AREA IS HABITABLE ONLY SERVES TO ERODE PUBLIC CONFIDENCE IN THE FEDERAL GOVERNMENT'S EFFORTS TO HANDLE HAZARDOUS WASTE PROBLEMS. IT IS UNFORTUNATE THAT THE TRAGEDY OF LOVE CANAL HAS CONTINUED IN THIS MANNER.

Senator **Chafee**. Thank you very much, Senator D'Amato.

Senator Randolph, the distinguished ranking member of the committee is here, and if you have a statement we would be very pleased to receive it at this time.

OPENING STATEMENT OF HON. JENNINGS RANDOLPH, U.S. SENATOR FROM THE STATE OF WEST VIRGINIA

Senator **Randolph**. Thank you very much, Mr. Chairman. I am not sure just what you were saying but you were energetic in saying it.

I will certainly read the complete text.

Senator **Chafee**. He wants to hear the testimony before making up his mind. I think that was the gist of the presentation.

Senator **Randolph**. It is a reasonable request.

It has been 18 months since the Superfund program was enacted into law. I think it is timely that this hearing be held to review the various components that are presently being implemented or have been implemented. We are often told that toxic chemicals pose the greatest potential threat to public health in the United States of America, perhaps in other parts of the world also. The Superfund program in which our chairman, and others of course, gave much time and commitment—the Superfund program is intended to provide the means for responding to emergency problems, situations that arise very quickly.

It is important that this program not be a program on paper but a program in fact. Therefore with vigor and determination I would advocate and I believe all members of the committee would desire the program to move forward hoping that it will be effective.

Approximately 160 sites have been chosen in this country for corrective action. This seems to me to be a reasonably good start but we must remember that there could be as many as 10,000—I question that figure but I was told that it could be a realistic figure—as many as 10,000 other locations throughout the country where work may be needed to prevent dangerous chemicals from entering the water supplies that are so essential to our livelihood or cause other types of danger.

There is a feature of this Superfund law which we will examine today. That is the requirement for the development of a national contingency plan. Since the national contingency plan was submitted as a regulation the members of this committee and members of the Congress generally must recognize that there needs to be an examination of the plan. If the plan is inadequate, if it does not cover the commitment we must report a resolution of disapproval. This hearing under your able chairmanship, Mr. Chairman, will be one part of the review of that plan.

There are several areas in which I personally am not satisfied with the provisions of the plan as it has been published. I think we all seek to have the revised plan moved ahead as quickly as possible. However, it must be an effective cleanup action and not a token one. We must balance our desire not to delay an already tardy plan revision against any dissatisfaction that we have with the plan itself.

Perhaps its failing can more easily be corrected by amendment.

Mr. Chairman, this is not a cursory subject with me or many others in the Congress. I join in the opportunity to hear testimony from the witnesses. These witnesses come from not one, but several Government agencies. They come from groups not within Government but those who have a keen concern in this hopefully important program.

The testimony can and will be helpful as we evaluate how these efforts to control hazardous materials is being carried forward.

I thank you, Mr. Chairman.

Senator CHAFEE. Thank you, very much, Senator Randolph. We appreciate your continued interest. You were one of the key movers in the construction, drafting, and passage of the Superfund Act and I know how deeply you feel about it.

Senator Moynihan, do you have a statement you wish to make at this time? We are delighted you are here. You are very able member of this subcommittee, of course, as well as the full committee.

Senator MOYNIHAN. Mr. Chairman, I have a statement which think I should put in the record.

Senator CHAFEE. If you wanted to make some comments on it at this time, it would be appropriate.

OPENING STATEMENT OF HON. DANIEL PATRICK MOYNIHAN, U.S. SENATOR FROM THE STATE OF NEW YORK

Senator MOYNIHAN. I will briefly. I apologize for being a bit late. Senator Cranston and I have an amendment on the floor on which debate began at 9 o'clock. We just used up our time.

I would first like to thank you for holding this hearing which I asked that you do. I would like to note that it is the distinction, if you like, of New York State that it was the discovery of the situation at Love Canal which finally focused this committee and the Nation on the problem of toxic wastes, a new problem reflecting a new state of the economy and the ecology which is the development of chemistry in the 20th century.

It is very likely that we are going to find that the problem of water borne toxic wastes is going to be a public health problem in the generations to come, very much as water borne bacteria was in the generations past.

Love Canal made this a national issue and let us through the Superfund legislation which we reported out in June of 1980 in the postelection session and from the first we have asked that the EPA both attempt to request and provide some resources for resolving the issues that arise.

Senator D'Amato, I believe, has expressed the concern that he and I share at the nature of the EPA report on the Love Canal. It was due in January of 1981. We blasted it out of the EPA in the spring by a letter which Senator Randolph, Senator Stafford, and I sent. We met in July with the representatives of the EPA and they handed us the report and it was with a printed cover dated May. And, then, we learned that there was some general dissent among the consultants to the EPA study in the first instance and only late in the proceedings was the National Bureau of Standards brought in to consider the methodology.

I would hope, Mr. Chairman, that our witnesses would know that we are respectful of complexity on this committee. We deal with it at levels, I dare say, that no other committee of the Congress has to deal with, the whole question of environmental matters.

We are respectful of differences in professional opinions. But we are also suspicious and alarmed that there is a pattern of avoidance in the Environmental Protection Agency in recent years in which they don't want, they will hear no evil, see no evil, and speak of no evil.

They certainly will not expend resources. The Superfund is now a very considerable size. It just stays there. In any event, there is the question of—I don't want to say integrity, but there is a question of procedure which really has to be a subject here. I hope that everyone would feel, as they testify before us, that the only thing that arouses the ire of this committee is if you were to be less than candid about difficulties because there are genuine scientific difficulties. There are disputes not settled. But that is one thing, to avoid the issue is another. That is why we are holding this hearing because we have felt you have not confronted this issue and we are not satisfied.

I thank you.

[Senator Moynihan's prepared statement follows:]

OPENING STATEMENT OF HON. DANIEL PATRICK MOYNIHAN, U.S. SENATOR FROM THE STATE OF NEW YORK

Mr. Chairman, today the Subcommittee on Environmental Pollution holds a most important hearing and one of particular interest to me. We are here to review the progress being made in implementing the Superfund program. We are also here to review the performance of several federal agencies in the preparation of the Love Canal environmental monitoring study released by the U.S. Environmental Protection Agency on July 14, 1982.

I would like to thank you, Mr. Chairman, for scheduling this hearing and for accommodating my request that a review of the Love Canal report be placed on the agenda.

It is certainly not inappropriate that both Superfund and Love Canal be on the agenda. In large measure it was the envents at Love Canal that led to the Creation of Superfund. We had discovered kepone in the James River and PPBs in cattle feed in Michigan, but most of all we had discovered tons of toxic chemicals at Love Canal.

Between 1942 and 1953 some 22,000 tons of organic chemicals were buried in the Love Canal in the City of Niagara Falls, New York. By the mid and late 1970's residents in the Love Canal area complained of odors and then chemical waste began to surface in the backyards of those closest to the Canal. We soon learned that Love Canal was not an isolated case of hazardous waste dumping. There were, we discovered thousands of hazardous waste dumpsites located across the nation.

On July 11, 1980 the Senate Environment and Public Works Committee reported out a Superfund bill (S. 1480), a bill of which I was an original co-sponsor. At the end of that year's lameduck session of Congress, the bill was passed and on December 11, 1980 it was signed into law (PL 96-510).

The Superfund law created a $1.6 billion federal trust fund to finance the cleanup of the abandoned or uncontrolled hazardous waste dumpsites and to respond to spills of hazardous substances. Seven-eighths of the trust fund's revenues were to come from a tax levied on 42 chemical substances and on crude oil and imported petroleum products. The remaining one-eighth was to come from direct federal appropriations. On April 1, 1981 collection of the Superfund tax began on schedule. As of May 31, 1982, $294 million had been collected.

In fiscal year 1983, there will be a total of $582 million in the Superfund Trust Fund available for appropriation. The Administration has only requested an appropriation of $230 million in fiscal year 1983, thus leaving a balance of $352 million in the Trust Fund.

The National Contingency Plan (NCP) for Superfund, due in June 1981, was only released by EPA in final form last month. The Plan contains the basic operating guidelines for the implementation of the Superfund program.

Perhaps most curious, on July 23, 1982, EPA announced that it was adding 45 new sites to the interim priority list of sites eligible for Superfund assistance. The original interim list of 115 sites was announced on October 34, 1981.

In making the announcement of additional sites eligible for Superfund assistance, EPA Administrator Ann Gorsuch said, "We are adding these 45 new priority sites simply because we ran out of work on the earlier 115. We are pushing progress on those sites as rapidly as possible." I say this is curious for several reasons.

There were eight sites in New York state on the interim priority list of 115 sites. Only four have received commitments of Superfund assistance. Actual Superfund-financed cleanup work has only begun at one site. As such I find EPA's assertion that the agency is running out of work at Superfund sites inexplicable.

I would simply say that the evidence shows that EPA has been slow to implement the Superfund program. I welcome the agency's testimony today; and hope that the issues I have jsut raised as well as others cn be explored in some detail.

It is also quite appropriate that we use our time this morning to help resolve the questions that have been raised by EPA's release of its Love Canal environmental monitoring study. Let me first say how unfortunate I believe it was that we almost literally had to blast this report out of the agency. The report was eighteen months overdue when on June 15th I asked the distinguished Chairman of this Committee, Senator Stafford, and the distinguished Ranking Minority Member, Senator Randolph, to join me in writing EPA Administrator Gorsuch to request that a specific release date be set for the environmental monitoring study. EPA responded and on July 14, 1982 the report was released.

After the release, the report, and the interagency process by which it was prepared, immediately became the subject of controversy. Questions about the report are not being raised without cause.

In May 1982 the National Bureau of Standards (NBS) presented to EPA its review of the monitoring and analytic techniques employed by EPA in conducting the Love Canal assessment. NBS concluded that, "EPA has not fully used its quality assurance data to derive estimates of precision, accuracy, and limits of detection. EPA has not incorporated estimates of precision, accuracy and limits of detection into its validated data base. Unless measured values, including 'none detected', are accompanied by estimates of uncertainty, they are incomplete and of limited usefulness for further interpretation and for drawing conclusions."

Based upon these NBS findings, the Department of Health and Human Services on June 14, 1982 reversed a conclusion it had reached in October 1981 after reviewing the monitoring data provided by EPA. The October 1981 conclusion was that the Love Canal "declaration area" is as habitable as the control areas with which it was compared. HHS had originally made this finding despite differences of opinion expressed by eleven non-federal consultants brought in by HHS to review the EPA data and to provide an assessment concerning habitability.

After a series of discussions in late June and early July with EPA and NBS, HHS reversed itself again and on July 13, 1982 reaffirmed its October 1981 statement that the Love Canal "declaration area" is as habitable as the control areas with which it was compared.

This entire interagency exchange raises serious questions about the strength of the report's final conclusions on habitability. It also raises larger questions about the federal government's ability to perform such a comprehensive environmental monitoring study. Certainly the latter issue is one which deserves our attention, especially in the context of the hazardous waste cleanup activities to be undertaken as part of the Superfund program.

Hopefully the discussion that we participate in today with the agencies involved in the Love Canal environmental monitoring study will help clarify a number of the outstanding issues about the report and its methodology.

I would also hope that we could use the lessons of this study to better prepare the federal government to undertake such efforts in the future. The establishment of set procedures and protocols for comprehensive environmental monitoring by federal agencies clearly seems indicated.

Again I want to thank our Subcommittee Chairman, Senator Chafee, for his kindness in scheduling today's hearing.

Senator CHAFEE. Thank you, Senator Moynihan.

As each of the members of the committee knows this hearing is an oversight of Superfund in which those interested in the Love

Canal will have an opportunity to pursue their particular questions. But I wouldn't want anyone to get the impression that the sole purpose of the gathering this morning is the Love Canal.

That is a very important part of it. We want people to have a chance to answer questions.

Another distinguished member of the subcommittee is here, Senator Mitchell.

Senator, if you have a statement, now would be the appropriate time to deliver it.

OPENING STATEMENT OF HON. GEORGE J. MITCHELL, U.S. SENATOR FROM THE STATE OF MAINE

Senator MITCHELL. Thank you, Mr. Chairman.

I am pleased that the committee has set these hearings to evaluate the effect of this significant law which we all participated in so actively and with such great interest in 1980.

I look forward to the questions, to the testimony of the witnesses.

I will say that there is one aspect of this law to which I devoted a great deal of time, effort, and attention in 1980 and which I intend to pursue with the members of the panel and other witnesses here today; that is, the failure of the law to provide compensation for persons injured as a result of the discharge of hazardous materials.

We now have an incredible situation in this law which I supported as best we could do at the time but we still have the incredible situation where if a child were standing next to a tree in a public park and a toxic discharge occurred damaging both the child and the tree, if the tree were owned by a public entity such as the State or municipality, compensation for damage to the tree would be available from the Superfund compensation, but compensation of the child would not be available.

The argument of who opposes the provision to provide adequate compensation for persons injured as a result of toxic wastes was that they have recourse to the courts.

I pointed out at the time that having spent most of my adult life in a courtroom as an attorney and then as a Federal judge that that access was in many cases more illusory than real and as a consequence I felt that the law should include compensation for persons.

We have elevated property rights in much of the law of this country far above that accorded to individuals. I feel that is a wrong set of priorities.

Section 301(E) of the law requires the study of the adequacy of existing common law and statutory remedies and providing legal redress for harm of man and the environment.

I understand that a first draft of that study is now ready and that it confirms the conclusions that I reached 2 years ago that there are substantial barriers to any action to recover damages for personal injury or property damages due to hazardous wastes.

I hope, Mr. Chairman, that on this committee and through these hearings we will again focus attention on what I believe to be a very serious problem, a very serious shortcoming of an otherwise very forward and progressive law and that is the discrimination against people and in favor of property which exists in this law.

I hope very much that we will explore that very thoroughly and that as a consequence new impetus will be given to the legislation which I have introduced to redress this wrong.

Thank you, Mr. Chairman.

Senator CHAFEE. Thank you, very much, Senator Mitchell.

Let us move right through the witnesses. We have 10 witnesses today. We have only 1½ hours. It may be that we will have to schedule a subsequent hearing. I don't know when we can do it prior to August 20. It may have to be in September. So Ms. Lavelle, we welcome you here.

I would ask that you proceed. You have a statement. If you wish to summarize that, that would be fine. I would like the witnesses to confine their remarks to 5 minutes if possible.

I will keep the hour glass on you. The 5-minute glass, but what I propose is that we go through the first five witnesses, then take questions to the panel as a whole.

So, Ms. Lavell.

STATEMENTS OF RITA M. LAVELLE, ASSISTANT ADMINISTRATOR FOR SOLID WASTE AND EMERGENCY RESPONSE, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY DR. COURTNEY RIORDAN, ACTING ASSISTANT ADMINISTRATOR FOR RESEARCH AND DEVELOPMENT; BILL HEDEMAN, DIRECTOR OF THE OFFICE OF EMERGENCY AND REMEDIAL RESPONSE; AND GENE LUCERO, ACTING DIRECTOR OF THE OFFICE OF WASTE PROGRAMS ENFORCEMENT; CAROL DINKINS, ASSISTANT ATTORNEY GENERAL, LAND AND NATURAL RESOURCES, DEPARTMENT OF JUSTICE; DR. EDWARD BRANT, ASSISTANT SECRETARY FOR HEALTH, DEPARTMENT OF HEALTH AND HUMAN SERVICES, ACCOMPANIED BY DR. WILLIAM H. FOEGE, DIRECTOR, CENTER FOR DISEASE CONTROL; DR. VERNON HOUK, ACTING DIRECTOR, CENTER FOR ENVIRONMENTAL HEALTH; AND DR. DAVID RALL, DIRECTOR, NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES OF THE NATIONAL INSTITUTES OF HEALTH; CAPT. CHARLES R. CORBETT, CHIEF, ENVIRONMENTAL RESPONSE DIVISION, U.S. COAST GUARD; AND BRUCE BLANCHARD, DIRECTOR, OFFICE OF ENVIRONMENTAL PROJECT REVIEW, DEPARTMENT OF LABOR

Ms. LAVELLE. Thank you, Mr. Chairman.

It is a pleasure to appear here before your committee and share with you the report on the progress thus far in the Superfund as well as answer the questions that I am sure all of you have.

With me today on behalf of EPA is Dr. Courtney Riordan, the Acting Assistant Administrator for Research and Development, Mr. William Hedeman, Director of the Office of Emergency and Remedial Response; and Mr. Gene Lucero, Acting Director of the Office of Waste Programs Enforcement.

As you stated, it has been more than a year since the agency reported to you on Superfund. We are very pleased to be here and share with you our accomplishments thus far.

Our first year was devoted to developing and putting into place the necessary and somewhat innovative management systems as well as strong policy and regulatory frameworks. Building on this base, we are now moving at an ever increasing pace into field work and remedial solution construction at numerous sites across the Nation.

I can sit here before you today and say that, furthermore, EPA, working with the States, has insured through 76 emergency removal actions that all hazardous-waste sites on the superfund list present no imminent hazard threat to local citizens. By the end of this year EPA, working with the States, will have completed an initial survey of the entire universe of all potential sites as we know them.

This is the 10,000 sites you were referring to, Senator Randolph. We will categorize these sites, prioritize and investigate them for any further necessary action.

In short, Mr. Chairman, while some would charge EPA has not moved fast enough nor spent money quickly enough, we hope to clarify the situation today by demonstrating that those criticisms are unwarranted.

In fact, EPA is building a remarkable record of results in its commitment to clean up abandoned waste sites that pose a hazardous threat to the citizens of this country.

By way of summary, so that we can get through in 5 minutes, I would like to submit my testimony for the record.

Senator CHAFEE. All the statements will go into the record.

Ms. LAVELLE. I would like to highlight for you what we have done in the area of enforcement since this is probably one of the largest areas of discussion.

Ms. Dinkins is here from the Department of Justice and can answer more specific questions you might have. We have developed a management strategy that effectively utilizes all enforcement authorities given to us under the act.

There were a number of them in that act. It was very wise of the Congress to give us all of these tools. The agency's imminent hazard enforcement program has led to the filing of 63 RCRA cases to the Department of Justice; 22 of the cases involve sites on the original or expanded priority list. We can report today that we have made progress in this area.

The agency has negotiated a total of 20 settlements overall, including 10 thus far in fiscal year 1982. All told the value of privately financed cleanup over the life of this imminent hazard program is an estimated $82 million thus far with more projected.

Another tool that we have developed in order to better manage our enforcement program is the dual track. This program allows us to go in at different phases throughout the program and negotiate with responsible parties. Through the use of administrative orders and orders on consent, we can use enforcement authorities that are much more timely in their response than the time-consuming, resource-intensive litigation that often goes on for many years.

One other question that is often brought up is what we have done with those sites that are not enforceable. When responsible parties have shown themselves unwilling or unable to act in timely manner, we have moved out with trust fund moneys.

Funds have been allocated for remedial action at 59 sites thus far for a total proposed allocation in excess of $65 million.

Of that amount, more than $44 million has already been obligated. We expect to obligate the remaining amount of allocated funds before the end of this fiscal year.

As I stated earlier, Mr. Chairman, we have not hesitated to use emergency authority under CERCLA. Thus far, we have authorized 76 emergency response actions costing more than $25 million.

Finally, we have been working very hard to come up with the cornerstone of our management system which we call the national contingency plan. The NCP was published in final form in the Federal Register on July 16. It represents regulatory reform at its best. It is a flexible framework on which to make decisions as to the extent of cleanup of any of our hazardous waste sites.

It provides guidelines for appropriate responses on behalf of 13 Federal agencies that are involved, and in behalf of the States and other involved parties in emergency response efforts.

We are proud of the NCP. It is a streamlined document usable by those in the field as well as those at their desks.

One interesting aspect that I think that should be stressed in this hearing is the participation of States. We at EPA projected a year ago a 30-percent rate of participation by the States in a lead role in remedial actions.

Very interestingly, the States have stepped in at an astounding rate of 83 percent thus far. We have entered into cooperative agreements at 24 sites and 9 more are pending at this time. We expect to move the States even further into every phase of the Superfund program and are frankly very pleased with their participation thus far.

In my written testimony, Mr. Chairman, I highlight the national contingency plan and answer a lot of questions that were stated when you invited us here.

As you are aware, we do chair the interagency budget task force under Executive Order No. 12316. This has been a very good mechanism for us to allocate trust fund moneys to the other Federal agencies as well as to involve them in solving the problems.

We met 3 weeks ago, and, as part of our budget task force discussions, and we had formed a submission for the 1984 budget request.

On Love Canal, Mr. Chairman, we can address this more specifically in questions and answers. But we feel that this represented a major milestone for agency involvement in hazardous waste cleanup.

The environmental monitoring study was the largest multimedia environmental monitoring study ever conducted by EPA. It involved more than 6,000 samples. We examined the potential and the existing contamination within areas 1 and 2 and within the broader scope of the declaration area.

As this committee is aware, the study was released and discussed with the public and concerned residents of the Love Canal area on July 14. We spent 3 days in meetings with concerned residents at Love Canal. At the request of residents, EPA returned to the Love Canal area for further discussions during the week of July 26.

The findings did show that toxic chemicals had migrated from Love Canal and contaminated shallow systems and ground water soil in the vicinity of area 1 houses.

The data also showed substantial contamination of local storm sewerlines as well as sediment areas outside the creeks in Niagara River.

Apart from these findings, however, no substantial amount of environmental contamination was detected in the declaration area. No patterns could be identified that would link contamination in the declaration area to migration of substances from the Love Canal.

More importantly, we have moved very quickly to take a Superfund remedial action at the site. We can discuss that, too. Again, we would like to thank you for the opportunity to share with you what we have been doing under Superfund.

I would ask people to please read the testimony because we do have very specific answers to the questions that the committee members have raised, and we have cited some specific successes thus far.

We continue to believe that it is not how many dollars we are spending to clean up the sites that would be the ultimate measure for success of management of Superfund, but it is the number of sites that will be cleaned up and the extent to which they no longer pose a threat to public health and environment in this country.

Our current approach we feel will achieve these goals in the most cost efficient and environmentally sensitive manner.

I would like to thank you, Mr. Chairman, for the opportunity to appear.

Senator CHAFEE. Thank you, very much, Ms. Lavelle for that testimony.

We will have questions later.

Ms. Dinkins.

STATEMENT OF CAROL E. DINKINS

Ms. DINKINS. Thank you, Mr. Chairman.

Mr. Chairman, I appreciate the opportunity to appear before the subcommittee to discuss the role of the Department of Justice in the implementation of the Comprehensive Environmental Response, Compensation and Liability Act of 1980.

Last July when I testified before this subcommittee, I stressed that an essential element in the successful implementation of Superfund, and the other statutes governing the handling and disposal of hazardous wastes, was a vigorous, effective enforcement program.

As the subcommittee is doubtlessly aware, the use of administrative and judicial enforcement has been necessary to insure that the important goal of voluntary compliance with environmental laws is realized.

Unless regulated entities understand that the Government will undertake prompt action to require cleanup of hazardous waste sites and recover the cleanup costs, voluntary compliance s likely to diminish.

The Department's primary role in implementation is to represent the EPA and the United States in defensive and enforcement litigation. EPA sets the policies and identifies the sites and potentially responsible parties, as well as the nature and extent of the hazard.

EPA then contacts the responsible parties to attempt to secure voluntary compliance at the sites. The decision to undertake formal enforcement action by administrative order or referral to Justice for initiation of litigation, is within EPA's area of responsibility.

We at the Justice Department have continued our efforts to insure close cooperation between EPA and the Department on enforcement matters.

In April of this year, Bob Perry, associate administrator, myself and our top management officials met at the FBI facility at Quantico, Va. to agree on procedures for our enforcement efforts.

We memorialized our mutually agreed upon approach in a document which has become known as the Quantico Guidelines.

The essence of that agreement is that prompt aggressive handling of enforcement actions, combined with close cooperation of our staffs, is essential to effective enforcement.

EPA and the Justice Department engage in regular consultation to insure that matters which require policy consideration are identified and disposed of quickly so that enforcement proceeds smoothly.

During the last year, the Department has devoted a substantial portion of its environmental enforcement resources to hazardous waste and Superfund enforcement.

Last July, I merged the existing hazardous waste and environmental enforcement sections of the Land and Natural Resources Division to allow us to respond more efficiently to EPA's enforcement initiatives.

The division at this time has more than 30 attorneys handling hazardous waste litigation. The number of paralegals in this litigation area has doubled. We have added five attorneys and two support staff to handle our existing and anticipated caseload under Superfund.

By the end of this fiscal year, we expect to add an additional 8 to 10 attorneys and additional support staff.

We will continue to add staff as the caseload requirements dictate. By the end of fiscal year 1982, the combined strength of the environmental enforcement section will be about 36 attorneys and 31 support staff, as compared with about 23 lawyers and 25 support personnel at this time last year.

The Department does not plan to maintain this level of resources and staff indefinitely. Superfund has authorized the Department to spend $2 million to pay for the litigation effort under Superfund, and to add up to 42 full-time employees as caseload levels require the hiring of additional personnel.

We have spent more than $627,000 during the first 3 quarters of this fiscal year and expect to spend over $1 million by the end of this fiscal year.

Much of the enforcement effort to which those funds have been devoted has been directed to the completion of cases on our existing docket, and coordination with the EPA in the development of new cases.

Since last July, we have finalized 15 settlements which will provide over $55 million in cleanup expenditures by responsible parties at hazardous waste sites.

Most of the Superfund cases on our docket at present are actions for injunctive relief under section 106.

Cost recovery actions under section 107 represent a relatively smaller portion of our existing docket. This is because most cost recovery actions cannot be filed until Superfund activity resulting in fund expenditures has been completed.

Of course we expect that such referrals will increase substantially during the next 3 years, and the States will play an important role in this area.

In October of last year, the Department conducted a harzardous waste training program for State attorneys general, and Federal attorneys from the U.S. Attorney's Offices.

The response was most enthusiastic. Over 100 attorneys attended the 3-day program. We gave written materials to each of them, providing over 1,000 pages of legal theories and a discussion of the technical bases underlying enforcement of hazardous waste cases.

The study mandated by section 301(e) of CERCLA has been recently completed and a limited number of copies, which are now being printed at the Department of Justice, should be delivered to Congress by late August. We have notified the staff of this committee that in order to make the study available to the public, the Congress may need to order a mass printing to supplement a limited printing.

Thank you, again, for the opportunity to testify.

Senator CHAFEE. Thank you, Ms. Dinkins.

We appreciate that testimony.

There will be questions for you afterward.

Dr. Brandt.

STATEMENT OF EDWARD BRANDT

Dr. BRANDT. Mr. Chairman, members of the subcommittee, I am pleased to have this opportunity to discuss the Department of Health and Human Services' implementation of health activities under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, or as it is more often called, the Superfund program. I have with me today Dr. William H. Foege, Director of the Center for Disease Control (CDC); Dr. Vernon Houk, Acting Director of CDC's Center for Environmental Health; and Dr. David Rall, Director of the National Institute of Environmental Health Sciences [NIEHS] of the National Institute of Health [NIH].

The Public Health Service through the Centers for Disease Control has responded in numerous environmental emergencies in recent years including the eruption of Mount St. Helen's and Three Mile Island. In addition CDC has conducted a long-term complex epidemiologic investigations of persons exposed to hazardous substances. Through the National Institutes of Health we support a broad range of research related to hazardous subtances including one activity of the National Toxicology Program which provides coordinated management of toxicological testing and testing development.

To bring this expertise together and to bear on implementing the health-related provisions of Superfund I have designated the Centers for Disease Control as the lead agency to coordinate implementation of Superfund activities. This interagency approach has been very successful. During the past year more than 100 health professionals from CDC, the NIH, FDA and other PHS agencies have been involved in Superfund activities.

Your letter of invitation cites five activities that are mandated under the law. Let me take just a moment to address each of those.

The first area you mentioned calls upon us to establish disease exposure registries. As you know, these registries are very expensive and take up to 25 years of followup to yield results. Therefore to provide full review and guidance on the registries we established a subcommittee on the use of long-term Registries for Health Followup of Population Exposed to Toxic Hazards. That subcommittee has now field its report and it is now being used for guidance in establishing registries under Superfund.

A second HHS activity mandated under the law is conducting health surveys and studies. As I will describe in more detail shortly, we are currently conducting or have finished such surveys and studies at five Superfund sites. We are also in the process of developing health study proposals at other sites.

We are further required to provide and develop testing for exposed individuals. CDC is now planning to apply new testing methodology to pinpoint more accurately the health effects of exposure to toxic substances. We have begun some testing of Superfund sites and plan to do more in the coming months.

The fourth area mentioned is our responsibility to maintain and provide information on health effects of toxic substances. The National Library of Medicine has assumed the primary responsibility for creating data records of chemicals from existing information. In addition, of approximately 150 chemicals so far identified in Love Canal and other dumps among Superfund priority sites, the national toxicology program has either tested, is currently testing or will soon test roughly 65 percent.

Finally, we are charged with the responsibility of keeping a list of areas closed or restricted because of toxic substance contamination. We have received preliminary information from EPA headquarters which has provided the basis for an initial listing of such restricted sites. We are also working with EPA Regional Offices, State and local health departments, and other local officials to expand that list, and more fully detail the type of limited access—for example, security fencing, prohibited swimming or fishing, or no trespassing signs.

The major document which outlines our health activities and provides the funding mechanism is an interagency agreement between HHS and EPA which was signed in March of this year. It outlines six areas of work and we have made some progress in all six. The first area of activity is scientific support. It provides for consultation to EPA by HHS physicians, epidemiologists, toxicologists, and other health professionals. Since signing that agreement in March, we have responded to 59 requests for assistance, 46 of which were such consultations which involved a broad range of hazardous waste problems. We expect an increased work load in this area as we now place eight senior Public Health Advisors in the EPA Regional Offices.

The second area of health activity is emergency response. That is, the provision of health-related guidance and laboratory support in emergency situations where there is potential exposure to humans following release of a hazardous substance. In essence we have provided assistance now to nine such emergency situations in the past 5 months.

The third area provides support for health studies and assessments undertaken by the Department at the five specific Superfund sites and those studies as I pointed out are nearing completion.

The fourth area calls for the development of additional health studies and we are currently in the developmental stage of a number of other health studies proposals.

Worker safety and health is the fifth area. That is of particular concern to us because if they are not adequately protected the cleanup crews and other workers at hazardous waste sites are more likely than others to suffer adverse effects. NIOSH, the National Institute of Occupational Safety and Health, is providing guidance to EPA in protecting such cleanup workers at hazardous sites.

The final area covers the expansion of the toxicology data base for health effects, including both the addition of chemicals to existing HHS information systems and recommendations for toxicological testing of chemicals for which adequate health data base does not now exist.

Your letter requested we also address our work with the EPA in assessing the health implications of the environmental monitoring data at Love Canal. I think since I am running out of time that the statement certainly details all of the activities.

Senator CHAFEE. I think this, doctor: Because this is a matter of intense interest to two of our Senators here this morning, that you might go into the Love Canal in some detail. Why don't you read that through because they will be interested, and true it does put you beyond your time, but I believe it is a matter of great concern to the Senators from New York as well as the rest of us.

So why don't you go through that starting on page 15?

Dr. BRANDT. All right, sir.

On May 21, 1980, the neighborhood outside the first two rings of homes surrounding Love Canal was designated a disaster area by the Federal Emergency Management Agency [FEMA].

I do have a chronology of the Love Canal situation which I can submit for the record.

Senator CHAFEE. I think that would be good.

[The Love Canal chronology referred to follows:]

LOVE CANAL - CHRONOLOGY

1890's	William Love digs canal
1942-53	Active dumping of chemical works
1953-1960's	Neighborhood development around Love Canal
Mid-1970's	First reports of chemicals appearing around dump
Spring 1978	Initial environmental testing and health questionnaire by NYSDH
August 1978	Evacuation of first two rings of homes
Fall 1978 - Fall 1979	Drainage construction work
1979	Community health survey by Dr. Paigen and residents
January 1980	EPA chromosome study started
May 1980	EPA chromosome study reported Federal disaster declaration EPA/HHS agree to do environmental and health studies
August-October 1980	Field work phase (specimen collection) for EPA environmental study completed
March 1981	EPA (Barber) writes HHS (Schweiker) to request discussion on health review of data when EPA analysis is completed
May 27-29, 1981	PHS meets with EPA to review raw data
June 19, 1981	PHS (Heath) requests data in manageable format
July 24, 1981	EPA (Hernandez) asks HHS (Schweiker) to keep all data confidential
July 27, 1981	EPA (Deegan) transmits environmental monitoring test results to PHS (Heath) with request to keep data "strictly confidential"
August 6, 1981	PHS appoints a group of non-Government reviewers
August 7, 1981	EPA (Hernandez) sends formal agreement to HHS (Schweiker) outlining the terms and conditions and scope of the PHS health review
August 13, 1981	PHS scientists meet with non-Government reviewers (and EPA) in Atlanta

September 15, 1981	PHS scientists submit their report (and comments of non-Government reviewers) to PHS and HHS
October 7, 1981	PHS and HHS accept the report of the PHS scientists as written
November 20, 1981	HHS (Brandt) transmits the PHS report to EPA (Hernandez)
May 12, 1982	EPA (Deegan) gives PHS (Hardy) a copy of: (1) draft Vol. I of the EPA report, (2) the NBS review, and (3) an EPA staff memorandum (Deegan to Riordan) responding to the NBS review
June 14, 1982	PHS (Brandt) transmits a modified statement regarding habitability to EPA (Hernandez)
June 29, 1982	EPA (Dewling) writes to PHS (Heath) with further information in support of the EPA data and analysis
July 1982	EPA and NBS meet to discuss the NBS report--HHS invited, but could not attend
July 8, 1982	EPA, HHS, and NBS meet to discuss the EPA and NBS reports
July 9, 1982	EPA provides additional analytic data and assurances to HHS
July 9, 1982	EPA provides HHS with written statement from NBS clarifying their position
July 13, 1982	PHS (Dickson) provides EPA (Hernandez) with a statement re-affirming the original HHS position on habitability

Dr. BRANDT. On June 4, 1980, the residents of the neighborhood were informed that the EPA and HHS would conduct a series of studies and gather information regarding their health status and any increased risk to health associated with living in that neighborhood. EPA then developed a protocol for an environmental monitoring study in the area to determine the extent and amount of contamination attributable to chemicals from the Love Canal. Field work for the study began in August 1980 and more than 6,000 samples of air, soil, water, and biota (plants and animals) were collected for analysis.

On March 4, 1981, the Acting Administrator of EPA wrote to Secretary Schweiker asking that HHS provide an interpretation of the health implications of the environmental monitoring test results when they were available. Public Health Service scientists involved in this effort included experts from the Centers for Disease Control and the National Institute of Environmental Health Sciences of the National Institutes of Health.

In late May 1981, the raw data including the results of over 100,000 laboratory test results were shown to the PHS scientists in a meeting at Research Triangle Park, N.C. The PHS team recommended that the raw data be arrayed in a manner which would facilitate a health assessment. The EPA staff agreed.

On August 7, 1981, after several weeks of staff negotiations, Dr. John Hernandez, the Deputy Administrator of EPA, and I signed an agreement under which HHS would review the EPA test results to assess their health implications for the residents of the Love Canal neighborhood. In this agreement it was understood that EPA had already conducted an internal audit of the sampling and analysis procedures and that the National Bureau of Standards [NBS] would independently review the study for precision and accuracy.

We also agreed that if the NBS review lead to questions or modifications regarding the EPA data, HHS would be given an opportunity to revise its findings. The PHS scientists who met in May with EPA to examine the raw data were asked to conduct the review for HHS.

The PHS team assumed the responsibility for making a professional judgment regarding the implications of the test results made available from EPA in four areas:

(1) Are the concentrations measured significantly different from levels found in other areas of Niagara Falls?

(2) Do the levels measured represent concentrations that could cause acute or chronic adverse health effects in people living in the Love Canal area beyond what might be expected under usual residential conditions in the Niagara Falls area?

(3) Were sufficient samples taken and analyzed to determine the extent of contamination by particularly hazardous materials and to be able to assess their potential threat to human health?

(4) Based on available data, can it be concluded that the area is not habitable?

It is important to note that these questions were asked only in respect to the test data results for the area outside the canal itself and outside the first two rings of homes surrounding the canal. This outside area has been referred to as the "declaration area."

The PHS team arranged for a group of nongovernment scientists with a variety of disciplines and representing the broad spectrum of views regarding the impact of environmental exposures to hazardous substances on human health be asked to examine the data and offer their opinions in response to the questions posed. This group met in Atlanta on August 13, 1981, and each of the 11 outside reviewers provided his opinion to the PHS team within 3 weeks of the meeting.

The PHS team conferred frequently during the month of September to draft a statement of general considerations and responses to the four specific questions. Their report (which is now part of the public record) was submitted to me and to the Secretary's office for review on October 7, 1981, and transmitted to Dr. Hernandez on November 20, 1981, as written by the PHS team. The PHS team considered the views of the outside group in developing their response, but the HHS report transmitted to EPA on November 20, 1981, reflects the professional opinion of the PHS team.

The PHS team noted that the test results provided by EPA, with the exception of dioxins found in the storm sewers and their drainage tracks, were in the same range in the declaration area as the levels found in the control areas. Since these data were presumed to be acceptable, the PHS team drafted responses to each of the four questions and included recommendations to EPA. I am submitting a complete copy of our report for the record. (See p. 257.) The written comments of the 11 outside reviewers were attached to the HHS report and have been made public.

HHS was not asked to participate in the review of the EPA monitoring program conducted by NBS. The NBS report was made available to HHS on May 12, 1982. The NBS review concludes that EPA did not adequately address the problems of limits of detection and sensitivity of analytic methods used. The PHS team reviewed the NBS report and concluded that the critique by NBS was such that they could not state with reasonable assurance that the area was as habitable as other comparable neighborhoods.

This view was transmitted to EPA in a modification of the HHS report on June 15, 1982. We realized at the time that we modified our statement that the citizens of the Love Canal area, who had anxiously awaited a statement regarding habitability based on the environmental monitoring study, were going to be disappointed by our inability to offer a recommendation. In our view we had two options, either to (1) recommend against a return to the neighborhood because prudent public health practice dictates erring on the side of safety in the absence of confirmed environmental testing data; or (2) to enter into active discussions with the EPA and NBS scientists in an attempt to clarify the issues and satisfy ourselves that the data could not be used to make a statement regarding habitability.

EPA and NBS professional staff were eager to include HHS in their discussions. After a series of phone calls, principally between EPA and PHS staff, a meeting was held on July 8, which included HHS, NBS, and EPA. In that meeting we asked EPA to assure us that the organic toxicants of interest which were reported to be nondetectable were indeed not present in levels greater than the low parts-per-billion range. We also asked NBS for a written statement confirming their verbal assertions in the July 8 meeting that the methods used by EPA in arriving at their conclusions were acceptable given the currently available technology.

On July 9 both NBS and EPA provided written statements regarding these technical issues which we accepted. Given the NBS and EPA statements the PHS team reaffirmed their original statement regarding habitability. That is, the levels reported in the declaration area outside the canal itself and the surrounding two rings of houses are not significantly different from comparison neighborhoods and present minimal health risk.

The potentially toxic materials found have not been shown to cause illness in people at the levels reported. This judgment, of course, is based on current medical and toxicological knowledge and was made in response to a clear need to make a recommendation to the citizens of the Love Canal area.

This opinion was not based solely on the evidence contained in the EPA documents. The PHS staff who drafted the statement are familiar with the data from the environmental studies down by New York State in the same area from which the EPA samples were taken. The results of the two environmental studies are consistent and provide further support for the statement that the declaration area outside the canal and the two rings of homes surrounding it is as habitable as control areas to which it was compared.

The PHS statement also contains a firm recommendation that the toxic substances, particularly the dioxins, found to be present in the storm sewers and the creek beds must be cleaned up. Also, it is imperative that the remedial work already done on and around the canal be permanently monitored and maintained.

Mr. Chairman, I am pleased with the work of the team of PHS scientists. They worked long and hard on a project over which they had little control. They met the timetables set for them and had the courage to make clear statements of professional opinion in a complex and controversial scientific field after thorough discussion and deep thought. Each of them deserves our admiration and respect.

I hope this summary gives you and other members of the committee an idea of the variety of health activities we are engaged in under Superfund, and of our involvement at Love Canal.

I would be happy to answer any questions you may have.

Senator CHAFEE. There is a 15-minute rollcall. I would like to take Captain Corbett if we might right now.

STATEMENT OF CAPT. CHARLES CORBETT

Captain CORBETT. Thank you, Senator.

You needn't turn your glass on me. I will be considerably less than 5 minutes.

Senator CHAFEE. That will give you our undying admiration.

Captain CORBETT. As noted in my July 1981 testimony before this subcommittee, the Coast Guard made several early conscious and deliberate decisions on how its responsibilities could best be carried out under the revised national plan. Specifically, we maintained that the strong national regional and local response organization has been proven time and again during the past decade should remain in place. And that the idea of the inland areas and coastal areas should be preserved.

Senator CHAFEE. I looked down. It is four pages.

Captain CORBETT. We are not going to put it all in. We would like it all to go in for the record.

Senator CHAFEE. Yes, but contrary to public view, we don't study every item that is in the record. Sometimes it is nice to hear it ourselves. Go ahead.

Captain CORBETT. We believe that the Coast Guard's role should reflect its maritime character by insuring response to oil spills and acute releases of hazardous substances in the coastal areas, and that the EPA should continue its role in the inland area. In addition, we believe that the EPA is a more suitable element of Government to assume responsibility for hazardous waste site response regardless of the location, inland or coastal; and, we believe that our field onscene coordinators must continue to have the latitude and authority to aggressively protect the public and the environment where necessary.

Mr. Chairman, each of these points has been incorporated into the new national contingency plan and I can report to you this morning that the plan remains the strong instrument that it has always been.

To date the Coast Guard has carried out 11 CERCLA funded response operations which have required access to approximately $700,000. These responses to acute releases have required immediate removal action and, therefore, prompt access to the trust fund.

The standing agreement between the Coast Guard and the fund administrator insured that prompt access to the trust fund, for the necessary sums, was available to take the action believed necessary by our onscene coordinators. I would like to note a few recent incidents that are characteristic of how the plan, and attending agreements, work:

Our first trust fund incident of real significance occurred in January of this year at Poughkeepsie, N.Y., when the Berncolor Dye Plant caught fire and exploded killing two workers, with the subsequent threat and release of several toxic chemicals into the environment. This unfortunate accident was the first opportunity for EPA and the Coast Guard to test the mechanism in place to access the trust fund.

The OSC's request for $50,000 met with immediate authorization in accordance with the terms of the agreement, and increases in funding levels during the course of the incident were authorized promptly by the trust fund administrator. Approximately $538,000 was expended on the removal operation.

In another incident, on April 30, 1982, the upper Mississippi River was closed to all marine traffic when a barge carrying 10,000 barrels of benzene collided with lock and dam 26. Although this incident occurred within EPA's geographic area of responsibility, the Coast Guard agreed to assume the onscene coordinator role primarily due to our experience with marine casualties.

This cooperation is typical of the close working relationship our organizations enjoy. The barge, in danger of sinking and leaking benzene, presented a major threat to St. Louis, Mo., just 15 miles downriver. Again, the trust fund was quickly accessed and the situation quickly resolved by removal of the barge and its cargo.

The OSC operated within a ceiling of $100,000.

Mr. Chairman, I have selected a final incident that deserves mention because it touches on one of the more difficult decisions which must be made by our people in the field. That decision is determining when an acute incident no longer requires immediate removal and should more properly become the subject of a more deliberate remedial action. On June 2, 1982, the Plastifax Co. in Gulfport, Miss., experienced a chemical explosion. The Coast Guard onscene coordinator immediately responded and accessed the trust fund in the usual fashion. Several days later, the OSC determined that immediate removal operations were complete and asked that the Coast Guard be relieved by the EPA. This transition was conducted smoothly and efficiently with all parties including the regional response team, in agreement.

In each of these incidents, State and local governments were active participants, the States having seats on the regional response teams while local governments more often interfaced with our onscene coordinators.

It has been our experience thus far that the States have not sought to assume the responsibility for acute emergencies funded by CERCLA. It is the Coast Guard's belief however, that State governments who possess the capability and determination to be in charge of response to acute incidents should be afforded that opportunity to the extent that the circumstances of the case permit them taking this responsibility.

That, Mr. Chairman, is an overview of the Coast Guard's implementation of CERCLA. It has been a pleasure to make this report to the subcommittee this morning and I will be happy to respond to any questions which you or the members of the subcommittee may have.

Senator CHAFEE. Thank you.

You say it has been our experience that the States have not sought to assume the responsibility for acute emergencies funded by the Superfund. Do you mean the spills?

Captain CORBETT. I mean the acute kind of a spill.

Senator CHAFEE. Where you might be involved they just as soon have you do it?

Captain CORBETT. Exactly. That is not to be confused with the more deliberate remedial action that might take place on down the line. We are talking about the catastrophic type of classic discharge.

Senator CHAFEE. There is a vote. We will recess and I would ask the members to come back promptly because we have a lot to do here and we want to proceed right through it. We will have a recess.

[Brief recess.]

Senator CHAFEE. The other Senators, including the chairman, will return shortly.

In the interest of time we will resume the testimony from this panel and I understand we have one more witness from this panel, representing the Department of Interior, Mr. Blanchard.

Would you go ahead and summarize your testimony?

Then we will proceed to questions.

STATEMENT OF BRUCE BLANCHARD

Mr. BLANCHARD. I would be pleased to.

I would like to thank you for the opportunity to be here and indicate that my responsibilities in the Department recently include our involvement with the national contingency plan and I would like to remark a little bit on the plan itself, the natural resource trustees and on the damage assessment regulations portions.

As far as the plan is concerned, we have been involved with it from the very beginning with the *Torrey Canyon;* worked with the Coast Guard in putting the first one together, and have been inrolved very deeply every since.

The national contingency plan over the last 12 years has been one of the most effective examples of the Federal interagency cooperation of any vehicle that we have worked with.

With regard to the current plan that is out now as of July 16, we participated in it and we support it. We look forward to its implementation following congressional review.

In the trustee area we have traditionally enforced our statutory and common law authorities regarding damages to national resources that we have been charged to protect.

Over the last decade we have seen an evolution of statutes which have acknowledged more and more liabilities for damages to national resources, and the Outer Continental Shelf Lands Act and the Clean Water Act amendments and CERCLA firmly establish the role of Government as the national resource trustee.

CERCLA itself provides that these trustees are responsible for assessing damages, seeking recovery for them and preparing and carrying out restoration plans.

I might add that these plans, if the damage occurs within the boundary of a State, must have public hearings and be reviewed and approved by the Governor of the State.

The act defines national resources and particularly identifies the State as the trustee for the natural resources within that State.

It identifies the Federal Government as trustee only for those resources that it has sovereignty over and those which it is authorized to manage and protect by statute.

The revised national contingency plan acknowledges that wider role of the State trustees and properly limits the role of the Federal trustees.

Section 301-C of CERCLA provides regulations to be used by the trustees in assessing these damages. The responsibility for preparing these regulations has been assigned to Interior by the President in Executive Order No. 12316.

We had anticipated this effort would be funded through Superfund but the act is interpreted to prohibit funding that. As a result we are now forming a team to develop these regulations by carving it from existing financial resources.

I will be heading that team. We recognize this appointment will be a difficult task and at this point we are uncertain how long it will take.

We will accomplish the job as rapidly as can be done.

We would like to thank you for the opportunity to appear before you. We would be happy to respond to any questions.

Senator MITCHELL [presiding]. Thank you, very much.

Senator D'Amato, do you have any questions that you would like to pursue? I will be glad to turn to you if you have questions.

Senator D'AMATO. Thank you, very much, Senator Mitchell.

Ms. Lavelle, on June 14, 1982, in a letter to the Senate Environment Committee, the EPA stated that the Love Canal report would be released by July 14.

Let me ask you: If HHS had not reversed itself and made its conclusions of habitability on July 13, would the report have been released on July 14?

If HHS had not reversed itself——

Ms. LAVELLE. Senator, as you are well aware, we are not afraid of hard decisions. I would say that we wanted HHS support and when they concurred with us in the findings, yes, that was very important to us in releasing our report.

Senator D'AMATO. If habitability findings had not been made by HHS, would there have been any such conclusion made by EPA?

Ms. LAVELLE. We would have reported out, yes. We would have reported that they had not concurred.

Senator D'AMATO. You would have reported that they had not concurred. As it is you just state within this little thing on the document entitled May 1982 and the only thing different here was this report.

How did you get HHS to agree to this? What did you do with them?

Ms. LAVELLE. Perhaps Dr. Brandt can— —

Senator D'AMATO. I will ask Dr. Brandt those questions.

I am asking you. How many meetings did you have with him?

Ms. LAVELLE. I would like to have Dr. Riordan come up because he was in the meeting with the agency.

Dr. RIORDAN. Senator, we had one meeting with HHS on July 8. That meeting was attended by the NBS and EPA. EPA, NBS, and members of HHS met on July 8 to try to resolve the scientific ambiguities that were the cause of HHS providing us with a modification of the earlier report on habitability.

Senator D'AMATO. Up until that time they were opposed? Right? They had indicated they weren't able to come to a decision; isn't that true?

Dr. RIORDAN. No.

Senator D'AMATO. On June 15, HHS reversed itself and said that they could not make a determination; is that correct?

Dr. RIORDAN. They supplied us with a report in November of 1981. In that report they gave us a conclusion about habitability that was conditioned upon the validity of the data.

At that time they were given data that had gone through EPA validation, but that had not been fully tabulated and analyzed by EPA, and summarized in report form. They were operating as we were operating in the summer of 1981 under the strong belief that it was the intention of the Government to get the Love Canal report out as soon as possible.

They gave us a report on habitability in November, 1981 but recognized that we were involved in a review process with NBS to support the validity of the analytical chemistry; they made their findings in November conditional upon the validity of the methods used being confirmed by the NBS review.

Senator D'AMATO. OK.

Dr. RIORDAN. Then NBS submitted their final report to us in May of 1982. The NBS report is a far-ranging and penetrating review of the analytical portion of the study. It provided us with much technical analysis as well as recommendations because it was based upon a draft report which was prepared in December.

Their review was not based upon the EPA report released on July 14, 1982 which incorporates many of the NBS recommendations.

In particular, NBS raised an issue in their review of the December EPA draft about the limits of detection, particularly in water. In the NBS report a statement is made that the possibility exists for detection limits to range by a factor of 10 among the participating laboratories in our analytical program; this observation caused both EPA and HHS concern because a factor of 10 raises the possibility of negative results occurring.

What went on during the period, June——

Senator D'AMATO. Wait a minute. On June 15, what did you do? Didn't HHS make a decision and then reverse itself and said, in essence, based upon the data that you received from NBS you declared that it could not be held to a conclusion of habitability?

Dr. **Riordan**. What happened was that we went back to HHS. I certainly talked at times to CDC employees in HHS, as others did, and asked: what is the nature of the concern? Why did you amend or modify the earlier conclusions and what in particular in the NBS review caused you to change your mind? So we said we would like to clarify with NBS what was meant——

Senator D'**Amato**. Doctor, let's get down to the point.

On June 15, did HHS issue any kind of recommendation or qualifying statement that indicated that at this time it could not conclude as to habitability? Didn't you do that?

Dr. **Riordan**. Yes, they——

Senator D'**Amato**. Oh, you did, on June 15, you said as a result of all of the scientific matters that you told me, what did HHS say? Didn't it reverse its initial position?

Dr. **Riordan**. They reversed their initial position because they felt that the NBS report questioned the reliability of the data.

Senator D'**Amato**. It took a long time; they reversed their position, then said there was a question because of the data as to habitability. Whereas, I initially said yes, it was habitability given the information you had.

You had further information. So we are now up to June 15 and you said, no, we cannot say that. OK.

Senator **Mitchell**. If I could interrupt, under the rules of this committee we have a time rule so that everyone gets a line of questioning in. I see your time has expired. We will have another round, as soon as everybody else has a chance. I see Senator Moynihan has the question for the time period and I have a few questions and we will come back to you, Senator D'Amato.

Senator **Moynihan**. I will pick up where Senator D'Amato left off.

There are problems, Dr. Riordan, and you are a scientist and a career servant of our Government and you know you have the respect of this committee and we don't mean to pillar you.

We know you would not do anything that you thought you could not defend but we have problems. There keeps appearing in this subject an urge to declare the subject closed before the evidence seems to have been obtained or analyzed and reviewed.

There is a document, a draft document, called "Environmental Monitoring at Love Canal, 1980," which is dated May 26, 1981. You are not responsible for holding in your head every piece of paper in EPA but let me tell you it reaches a conclusion. "No compelling monitoring evidence can be found that would render area houses, apartments, and other buildings unfit for habitation or other use."

This is a draft document in EPA and was dated May 26.

Just a few weeks earlier you had asked Dr. Brandt's office if they had reviewed the data for you. So the center's first verdict afterwards—there is sort of an Alice in Wonderland quality here.

Then we were expecting this report in January of 1981.

As you know, I had to do all sorts of mischief to get a document. Then we got that document in July and it was dated May.

Now we hear of this exchange between, first, the National Bureau of Standards who says they really don't think the statistical technicians are reliable, in which event you say then the conclusions are not wanted but then they have a meeting and you are under a certain time pressure.

I think we met with you on July 12, was it?

Dr. RIORDAN. It was July 13, I believe.

Senator MOYNIHAN. You had 5 days before you finally met this. You couldn't avoid us at a certain point. We have a meeting in which everybody gets together and says, oh, well, let's go with the conclusion of our draft report not that this was said, but let's agree to what at least in one part of the EPA we had declared we had found 1 year ago before our evidence came in.

Can you help us with this? Speaking to a scientist with the respect of this committee, Dr. Brandt, we are just troubled. We are not accusing. But we know that there is a pile of issues in the probability analysis in all of these toxic questions but my goodness, there were an awful lot of decisions in very short order.

Dr. RIORDAN. I guess I can address two points.

The first one has to do with the appearances in the EPA report of a statement on habitability. From the beginning we had to face certain issues on habitability. One was, suppose you get results from the monitoring program which indicate high levels of contamination.

We decided we would have the responsibility at that point to go public immediately with those findings, particularly if the concentration levels were such that most reasonable people would recognize them as representing a case of immediate potential injury to public health. That was one aspect of habitability and we recognized it from the beginning.

The other was, suppose you come up with measurements in the declaration area that are low levels but are such that they should receive the attention of a health scientist before you would attempt to come up with a habitability decision, and then the question would be, should we do it or should HHS do it?

So that is where we had an ambiguous position. But then there was a third alternative, and that was, we thought if you came up with the possibility of virtually no measurements of the contamination in the declaration area, then there was no reason that you couldn't speak to inhabitating the area because of contamination from Love Canal, because there would be no contamination.

Senator MOYNIHAN. When you say no measurements, you mean no finding after having taken the measurement, not having found any.

Dr. RIORDAN. That is right, that there would be——

Senator MOYNIHAN. This is different from no measurement.

Dr. RIORDAN. There was ambiguity in the agency relative to habitability because we realized there was a likelihood in what I guess we would call situation "B," in which we would find some contamination but it wouldn't be sufficient for us to say it was endangering the public health nor would it be such that we would say no environmental contamination was caused by Love Canal.

We made the decision in March of 1981, to ask HHS if they would assist us with that interpretation of the data.

At the same time within the agency that draft document was being circulated at a staff level where certain staff people were trying to produce the document, taking into account their best judgment as to where the agency would have to come down on the issue of habitability.

Senator MOYNIHAN. You would allow that was premature?

Dr. RIORDAN. It was not premature. It was at the staff level. It was long before it got agency sanction.

The second area deals with the reliability of the data; NBS' doesn't say that the EPA data are unreliable. NBS is not in the business of certifying data. What we asked them to do was to provide us with a technical analysis of the EPA reports, and to offer judgments about various aspects of the program, in particular the quality assurance aspects of the program: did we choose good methods, did we design good quality assurance, did we implement a reasonable quality assurance program?

There is a set of, I believe, seven questions that they were asked to address. They did that with a great deal of precision and I think a great deal of quality.

In the NBS report some issues were raised that had already been addressed in the EPA final report because NBS was reviewing a report that was a draft report, a December report supplemented by some quality assurance appendixes that were provided in the period of February through March of 1982. But they were not complete. It was an ongoing dialog between ourselves and NBS.

They were giving us advice as to how we might better analyze and document our data so as to provide the kind of reliability, in the public eye that we thought was needed in a study of this consequence.

Senator CHAFEE. I have to briefly interrupt here. We have a problem. We have another panel coming.

Regretfully, I will have to announce that it just appears due to the problems that are coming up that we won't be able to hear the other panel.

What I would like to do is, as I see it, everyone on the panel is in the immediate region, except Mr. Tyler.

What I would like to do is to take Mr. Tyler's testimony at the conclusion of these questions. If one of the Senators could chair that, and then we will just have to have the balance of the panel back some other time.

I regret doing that. But unless one of the Senators could take this afternoon.

Senator MOYNIHAN. Mr. Chairman, I have been asked to come to the floor. I wonder if one of the ways we can proceed is to submit questions.

Senator CHAFEE. It turns out there is another hearing in this room. Yes, of course, Senator. I am not trying to interrupt this panel. I am just trying to give some notice to Dr. Hair, Christine Hall, Jeff Diver, and Dan McGrade.

I understand Jeff Diver is from out of town too.

The others are excused. Let's see if we can take Mr. Tyler and Mr. Diver later.

Senator MITCHELL. Mr. Chairman, to accommodate them I will be willing to stay through the lunch hour after the noon vote, if you would like that.

Senator CHAFEE. Take the two from out of town?

Senator MITCHELL. Take them all.

Senator CHAFEE. I think Dr. Hair just left.

Do we have Dr. Hair. Do we have him or did he disappear?

Catch him if you can. At the rate these elevators leave, he won't be going far.

That is very nice of you, Senator.

All right, we will proceed on that basis.

Senator Mitchell will take the second panel as soon as the noon vote is over.

He can get here. That is excellent. We appreciate that.

Senator MITCHELL. I deferred initially to Senators D'Amato and Moynihan, Mr. Chairman.

I would like to ask a couple of questions.

Senator CHAFEE. Proceed.

Senator MITCHELL. In the interest of time, Ms. Lavelle, I have a series of questions regarding a specific site in Maine which is one of the 115 sites identified across the country last October.

Of course I don't expect you would be personally familiar with that at this time. In any event, I will submit those questions to you in writing.

Ms. LAVELLE. Thank you, Senator.

Senator MITCHELL. I would like to ask you a question which is somewhat more general than the questions regarding Love Canal but deal with the same question of public health.

I understand one of the purposes of this law is to provide cleanup of hazardous waste to protect the public health.

My question is, What is the procedure by which EPA terms whether it is necessary to examine residents of a particular site area for potential health damage as part of its response and how many sites on the Superfund priority list are health studies being conducted?

Who requested that the studies be undertaken? Is there a procedure for determining when a health study will be conducted or does it depend upon some person outside of the EPA asking for such a study?

In other words, I would like to get a statement from you as to what approaches are used regarding health studies on these sites.

Ms. LAVELLE. Senator, there is no written policy from a national perspective per se but a policy of actions emerging on a site-by-site basis.

I will ask Mr. Hedeman to address some of the specifics that you asked and then perhaps in writing we can get into more of the discussion from the national perspective.

Mr. HEDEMAN. Senator, the recently published national contingency plan establishes or reestablishes the concept of a national response team and regional response teams.

I am chairman of the National Response Team and on that team are representatives from 11 other Federal agencies, including the Department of Health and Human Services. Comparable representatives exist on regional response teams and can be tasked as needed on a site-by-site basis to deal with these studies.

The initiative for that would come from either the Environmental Protection Agency or the Coast Guard, depending on who assumes the lead at a particular site or spill.

In addition, as Dr. Brandt indicated in his testimony, individuals from the Center for Disease Control within the Health and Human Services will be placed in EPA regional offices about the end of August to assist our staff in analyzing individual sites.

To date, health consultations at sites on the interim priority list have occurred at 46 sites. We can provide other data with respect to individual sites. I must confess that I don't recall the remainder of your question.

Senator MITCHELL. The question is since, as Ms. Lavelle indicated, there are no established criteria for determining when or if a health study should be conducted, how did you decide to conduct studies at the 46 sites which you have just identified?

Mr. HEDEMAN. This was through the consultation with the individuals on the regional response teams representing EPA, the Coast Guard, and the Department of Health and Human Services.

Senator MITCHELL. How was it decided? By what standard, by what criteria is the decision made that there will be a health study at site A but not at site B?

Mr. HEDEMAN. There are no specific criteria but only an examination of the particular facts relating to a site as they may relate to public health problems caused through air, water, and land medium.

Mr. MITCHELL. But, you see, the decision to conduct a health study or not to conduct a health study requires some criteria by someone, even if it is a subjective criteria in one individual's head. Somebody must make the decision that a health study is warranted or is not warranted, is necessary or is not necessary.

What I think you are saying is that there is no uniform set of criteria. These are ad hoc decisions made by individuals and I guess my ultimate question is should there not be some criteria? Should not the decision as to whether or not there is going to be a health study at a site in New Jersey be the same as whether it is going to be a health study at a site in Atlanta, California, or Maine?

Ms. LAVELLE. Senator, I guess I would say it is a little premature yet. We are still working out whether there is a chronic situation, a key situation in one of these sites, working, as Mr. Hedeman said, with the local response team and the National Response Team.

We are prioritizing and coming up with those sites where we should do a study. We also work very closely with HHS in terms of short-range and long-range studies. We work with them, as Dr. Brandt testified, specifying, I think you said 68 pollutant situations, that seem to be characteristic, to be added nationwide.

Senator MITCHELL. Ms. Lavelle, it is not premature, because as Mr. Hedeman just testified, you have made a decision previously to conduct health studies at 46 sites. So therefore, there is an ongoing process by which some individual somewhere or some group of individuals makes a decision that a health study is warranted, or is not warranted. So a procedure is already under way.

All I am trying to find out is how is that decision made, by what standard and by what criteria, and if there's no uniform criteria being applied nationally, should there be such a standard? Should there be such criteria written down, published, the subject of debate and discussion so that we can see the process by which these decisions are being made? It is entirely possible, although I would guess not likely that somebody already is doing this. That is all I am trying to find out.

Mr. **Hedeman**. Senator, let me respond to your question and comments by saying that as Chairman of the National Response Team, I will raise this at the next and subsequent meetings of the response team with the other Federal agencies which would include the Department of HHS, the Coast Guard, and others, and seek their collective wisdom on this point.

The point you raise may be one that we would want to pursue. And if that is the case, we would obviously go in that direction.

Senator **Mitchell**. I would ask you, whatever you decide, to report back to the committee so that we have the opportunity to evaluate in our wisdom what we perceive to be the wisdom of your judgment.

Mr. **Hedeman**. I would be delighted.

Dr. **Brandt**. Senator, if I could address that from the standpoint of the Department of Health and Human Services. In the Public Health Service, our process for advising EPA about whether health studies are indicated or not depends in part upon the kinds of chemicals or the kind of substances involved.

Since we do have the National Library of Medicine set up with information, if there is a substance that is known to have either acute or chronic health effects, we might recommend, therefore, the health study be done. If, in fact, these chemicals have no known health effects or are known not to have health effects, then of course we would recommend that there not be a health study.

Furthermore, if there are reports of health complaints from the populace, either of preponderant or severe symptomatology, or other kinds of findings clearly we would recommend an initial health study.

So our criteria are based upon (a) the nature of the substances involved, (b) the likelihood of exposure of the populace in the area, (c) any reports, information, or other indication of illness or birth defects occurring in the area, and (d) the knowledge that is already known about either acute or chronic health effects. That is the basis upon which we make our recommendation.

Senator **Mitchell**. Thank you.

Mr. Chairman, I have some questions for Ms. Dinkins on the subject I had mentioned in my opening statement; that is, the report of the study group under section 301. And also some questions regarding enforcement under the Superfund law as it now exists, the record of enforcement specifically. In the interest of time, Mr. Chairman, I will submit those questions to Ms. Dinkens in writing so that others may proceed with questioning.

Senator **Chafee**. Right.

I would appreciate it if in replying to Senator Mitchell you might also send a copy to the committee so that we could have the benefit of your remarks.

Senator Randolph also has some questions which will be going, principally, I believe, to Ms. Lavelle.

Senator D'Amato, do you have anything further?

Senator D'AMATO. Mr. Chairman, one further observation. Let me thank the chairman for his graciousness in giving us this opportunity to make our views known. I will ask Dr. Brandt. Dr. Brandt, let me read to you what one of the 11 scientists who state similar viewpoints, Dr. Robert Medcalf, University of Illinois, one of the consultants to HHS, said in part, "The writer does not believe that it would be responsible to advise inhabitants that the area is totally safe. Certainly he would not want to expose himself, his family, or his friends to these hazards of chemical pollution through lifetime residence there.

We go down a whole host of renowned and distinguished scientists that HHS retained. Were these scientists consulted on the conclusion of habitability that HHS finally came to prior to the release of the report or was it not possible given the last minute, the day before, you made this switch on July 13?

Dr. BRANDT. Indeed, Senator, each of the consultants was asked to provide his answer to the question of whether or not the area was habitable.

You have quoted 7 out of 11 disagreed with the conclusion. I don't think these issues can be settled by a vote, but 8 of them have told us that they agree with the conclusion, 8 out of 11.

Senator MITCHELL. Seven out of 11 didn't agree, how could 8 out of 11 agree?

Dr. BRANDT. I don't know where you got your seven. But I have a list here in front of me.

Senator MITCHELL. Dr. Stephen Aust, University of Michigan, Department of Biochemistry, "In general I believe this study was fairly well conducted."

Dr. BRANDT. He said he cannot conclude that the area is not habitable.

Senator MITCHELL. Richard Browner, Georgia Institute of Technology: "There remains a lingering concern that much of the information contained in the report is not fully clarified at this time."

A Professor of Toxicology: "I would not advise residents of this area to move out, but neither would I encourage new residents to move in."

Dr. Joseph Highland. "I certainly do not believe that the evidence we are asked to consider allows one to conclude that the Love Canal area is a safe place * * *" and it goes on. I would suggest maybe you decided to interpret this because of the fact that EPA put the pressure on, the State officials put the pressure on.

Dr. BRANDT. That is just not accurate, Senator. In fact, let me go to the whole issue of our—what you call flipflopping. In our initial report which was filed and it is dated October 7, 1981, I would like to read to you what we say. The evaluation of—this is a direct quote.

> The evaluation of data provided here is made on the assumption that the methods used by EPA in collecting, storing, and testing specimens were satisfactory. Independent review of these aspects of the data is currently being performed for EPA by the National Bureau of Standards (NBS). Should the NBS review suggest methodologic deficiencies in the EPA data set, the health evaluations presented here would require reassessment.

So what we said initially was the area in our judgment is habitable if the data sets are accurate. We were then provided information in May by the NBS which said that they questioned some of the data methods and in fact our statement at that time, which we filed on June 14, was a letter to EPA in which we said the following:

> The NBS review concludes that EPA did not adequately address the problems of limits of detection and sensitivity of the analytical methods used. In the instances where EPA detected contamination, it is reasonable to conclude that chemicals were present. However, in the instances where EPA reports the absence of contamination (about 90 percent of the values reported), no strict quantitative interpretation is possible and judgments about the habitability of the area cannot be based on these values.

We therefore said originally if the data are OK, the area is habitable.

We then had information that the data were not OK. So we came back and said the data are not OK; therefore, we cannot make a judgment. Then on July 8, at the meeting that NBS and we attended (with five people from the CDC), the NBS came back and wrote that they in fact withdrew their objections about the earlier data set and we said, OK, since the data is OK, as we had originally said, we will now conclude that the area is habitable.

The issue of what the consultants have said one way or the other, is a matter in part of trying to interpret. I can pull some statement from each of those same people to point out that, for example, from Browner, who said the area is habitable. It is fairly hard to argue with. We were not under any pressure that I am aware of from the EPA to agree with them, disagree with them, or otherwise. I think had we to do it over again, we would have addressed the issue of the adequacy of the data ourselves instead of leaving that up to NBS. However, in the original agreement, which I worked out with EPA, therefore, I accept the responsibility for it, we agreed to accept the NBS analysis.

Senator D'AMATO. Mr. Chairman, I certainly have many other questions, but time does not permit, and I do not intend to impose upon the generous offer of the Chairman of this committee.

Senator CHAFEE. Senator, if you wish to submit some more questions in writing, I know this is an issue of great importance to you and to your constituencies. If you want to have one more question now—what is your pleasure?

Senator D'AMATO. If I might, if it seemed that in between this June 15 and the famous July 8 meeting, as it is characterized, NBS—I don't know if they did it at the July 8—but in between the time of July 8 and 9, that one day, they reversed their position, didn't they?

Senator CHAFEE. Why don't we do this, Senator? I have to go over to vote. Why don't you finish your question? At the conclusion of the Senator's question, we will recess. Senator Mitchell will return, this panel will be dismissed. We will thank you for coming and then if the next panel would come up, we will try to move as expeditiously through that.

When you finish your question, this panel will be excused and we thank you very much for coming.

Senator D'AMATO. The July 8 meeting, there was still a question in terms of NBS and the criticism that NBS had made. Is that not correct?

Dr. **Brandt**. That is correct, yes; I mean prior to, up until the July 8 meeting, the NBS had been critical enough of the data sets that we began questioning the adequacy of the data.

Senator D'**Amato**. Are we saying that as a result of the July 8 meeting, NBS came away with enough information to then reverse its initial determination that there was inadequate testing; is that correct?

Dr. **Brandt**. The NBS certainly wrote to EPA on July 9, satisfying all of our concerns about the adequacy of the testing; yes, sir.

Senator D'**Amato**. What took place on the 8th that would lead you to make this determination? What information was given to them so that they could now determine that where they first criticized the method of testing, et cetera, that now the standards set were appropriate?

Dr. **Brandt**. I think EPA has to answer that question because they are the ones that supplied the information to the NBS. We were certainly there to try to get our own concerns answered.

Senator D'**Amato**. If NBS had not reversed its position on the 8th or subsequently on the 9th, the day after that meeting by letter, you still would have then maintained that the data was not conclusive enough for you to make the assumption in terms of habitability, is that correct?

Dr. **Brandt**. That is correct, yes, sir.

Senator D'**Amato**. So that the critical question is how did NBS come to, on that one day, change its——

Mr. **Riordan**. Senator, it is not a matter of changing position. Basically the NBS report, based upon the earlier drafts of EPA, admonished us that you could not release a report to the public in which you indicate numerous trace level or below detection results unless you have qualified the accuracy of those minimum detection limits.

In fact, there is a statement in the NBS report that says that by looking at the data that we had, you might have detection limits among labs that could vary by as much as a factor of 10. That was a position that could be derived from the draft reviewed report that NBS responded to, that—namely that we had not adequately documented and explained what the 90 percent of the results that were below detect or trace concentrations really meant in terms of probabilities that there was something out there in the environment.

In the meantime, we had responded to the NBS criticism that had been verbally transmitted to us earlier, by going back to the water measurements and more fully analyzing the data from the labs, and quantitatively establishing what we call method detection limits. Those appear in the EPA final report, the report that NBS did not have. What the July 8 meeting did was to allow NBS to examine what we had done in the interim, and also to allow them to confirm whether our approach toward establishing method detection limits was reasonable. In fact, what they did was as a result of the July 8 meeting, to outline in a memorandum dated, I believe, July 9, from NBS to Dick Dewling of EPA, three conditions that had to be met in order for them to underwrite the establishment of method detection limits.

The first item was to present the raw data and the chain of logic used to arrive at the method detection limits. We have done that in the report. So we met condition 1.

Then they said EPA should compute the actual method detection limits for the measurements, as made by the laboratories. We have done that. That is on page 221, I believe, appendix C of the EPA final report.

Finally, they said EPA should demonstrate that the 28 compounds that we used for the establishment of method detection limits were representative compounds for all of the chemicals that we measured at Love Canal. We have a document of July 9 from the chief of our Advanced Instrumentation Section on the Physical and Chemical Methods Division at our laboratory in Cincinnati which was provided to HHS and to NBS, which indicates the rationale behind the use of those surrogate chemicals to establish method detection limits.

That is the basis of the activities EPA initiated to clarify HHS's interpretation of what NBS meant, when NBS said that we ought to do a better job defining what those detection limits really were.

Senator D'Amato. Doctor, I think in your very reasonable explanation as to how certain of these things were handled, that you would have to acknowledge that it would be rather difficult for the public and maybe even this Senator to be able to put the kind of confidence in a report of this type that the public should be able to rely on. I think that at the very least it was done in a haphazard, slipshod way.

Can you imagine a report that had been worked on for over 2 years, a study of this magnitude, of this nature, with this much money with the technical data or new information coming literally 24 hours before the report is to be made public on a sheaf of paper inserted here, 1½ pages, a meeting that is called 5 days prior to the final conclusion at which your agency then gets new information and makes a new determination on the 9th and then incorporates it into the 13th. Then to indicate that the people are not to be doubtful?

I think it is incredible. I think it is shocking. I think it is poor performance. I am not talking about you or your technical staff, or the evaluations that you made. I think that this kind of situation where these reports and these documentations and these switches are made 24 hours prior, 4 days prior, 5 days prior to the release of this report, can't help but lead many people to the conclusion that you already had a conclusion and consequently that this information was pressured out or maybe even a very fine scientist taking those parts that they wanted to take and disregarding the other.

That does not mean to impinge on the integrity of any of the scientists, but it leaves a heck of a lot to be desired in terms of the manner of implementation, in terms of the manner of reports and it does lead people to believe that the press up in Buffalo says, "The State wants a decision on Love Canal, a source famliar with the briefing." This is from the famous EPA meeting which said, "EPA officials were told by the Health and Environmental officials, Dr. Axelrod, they had damned well better address the issues when they release this report." This has been shrouded in this kind of activity. I think it is unfortunate.

In the interest of my making that vote, Senator Mitchell will be back here any minute, I thank those of you for giving the testimony.

We have some other questions which I will ask be submitted to you. I will ask you to respond in writing. Thank you.

[Brief recess.]

Senator MITCHELL [presiding]. We will resume the hearing with the second panel and why don't we take the panelists in the order in which they are listed on the witness list which means that the first witness will be Christine Hall, chief attorney of the toxic chemicals program, accompanied by Dr. Ellen Silbergeld, chief toxics scientist, Environmental Defense Fund.

Could I ask all the witnesses in view of the time constraints to which Senator Chafee alluded and I am happy to be able to be here to accommodate you. I do have some questions I would like to ask, if you could summarize the testimony that you are going to give, the entire statement will be inserted into the record. Then perhaps we can get some discussion of some of the points in your testimony.

STATEMENTS OF CHRISTINE HALL, CHIEF ATTORNEY, TOXIC CHEMICALS PROGRAM, ENVIRONMENTAL DEFENSE FUND, ACCOMPANIED BY DR. ELLEN SILBERGELD, CHIEF TOXICS SCIENTIST; JAY D. HAIR, EXECUTIVE VICE PRESIDENT, NATIONAL WILDLIFE FEDERATION; GEORGE TYLER, ASSISTANT COMMISSIONER, NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION, TRENTON, N.J.; JEFF DIVER, WASTE MANAGEMENT, INC., REPRESENTING THE NATIONAL SOLID WASTE MANAGEMENT ASSOCIATION; AND DAN McGRADE, STAUFFER CHEMICAL, REPRESENTING THE CHEMICAL MANUFACTURERS ASSOCIATION

Ms. HALL. Thank you, Senator Mitchell.

We welcome the opportunity to present our views today. The delays, disruptions and program misdirections which have characterized this administration's implementation of Superfund require very close congressional oversight. Congress intended in the creation of Superfund a mechanism to provide financial and other incentives to assure timely clean up of spills and hazardous waste sites. They intended a mechanism for coordination that worked quickly, smoothly and adequately to protect public health. That has not happened.

As indications of that, the National Contingency Plan was delayed for over a year and promulgated in very weakened form. A critical set of regulations governing natural resource damage has not been promulgated and will not be promulgated according to the congressional deadline. The citizens affected by cleanups at Superfund sites have been locked out of the process. Health evaluations are moving along very slowly and they have certainly gotten a very rocky start with the Love Canal report. Last and most important, perhaps, very little has been accomplished under Superfund in terms of actual cleanup. I will quickly go through each of these.

The National Contingency Plan is the cornerstone—by Ms. Gorsuch's own admission—of administration of the Superfund. It is the who, what, where and how much of cleanup. It was 1 year late and published only as a result of continued lawsuits. Frankly, as one of the litigants in that process, we are not sure whether it was worth the fight. As a coordinating mechanism and a means of setting minimum criteria for cleanups it fails. The National Contingency Plan as promulgated means that cleanups will be taken on an ad hoc basis and will result in inadequate cleanups at some sites.

The natural resource regulations will be late. I will leave most of the discussion of this to Dr. Hair but needless to say we feel this is a very important part of Superfund that has not received the attention that it deserves.

Superfund was passed by primarily to protect public health and more than any other Federal statute it has impact on local citizens. What kind of cleanups are taken and how quickly they are taken means it will effect the future of the people around the site and the future of their children. Therefore it is only a matter of commonsense that local citizens be included and integrated into the decisionmaking process under Superfund. This has not happened.

In many sites that EDF has worked closely with, the most common complaint has been that the citizens have been locked out of the process, that information is not available when requested, including data from monitoring results. Public hearings, if they are held, are held, to justify decisions that are already taken. Citizens are locked out of negotiating processes that are ongoing between EPA. The States and private parties and are not allowed to participate.

Senator MITCHELL. How can that be done?

Ms. HALL. The negotiating process begins before suit is actually filed. So there is no right of intervention in the negotiations and to date we know of no group that has been included in those informal negotiations that are going on pursuant to EPA's enforcement efforts.

Senator MITCHELL. Do you propose a mechanism in your statement for public participation? Obviously you can't hold negotiations in Yankee Stadium and have everybody there. I can understand the desire of public participation. I support it. But I wonder if beyond criticizing their lack, their failure to do that you have in your statement some specific recommendations for how public participation can be increased without sacrificing the integrity of the whole process?

Ms. HALL. The citizens with whom we have been in contact—a group of about 30 from 20 different sites—will be drawing together a set of proposed guidelines and presenting them to Ms. Gorsuch the first week in September. That will include the negotiating process as well as citizen participation.

Senator MITCHELL. Will you make a copy of that available to this committee and to me?

Ms. HALL. Certainly.

Senator MITCHELL. Thank you.

Ms. HALL. In the health area, as has already been well documented, there have been delays in setting up any sort of process for determining what the health effects are at hazardous waste sites and from hazardous substances. We feel very strongly that there needs to be a more established procedure for enlisting CDC and making sure that the intent of Superfund in beginning to gather fundamental health statistics is put together.

We are among those who disagree with the conclusions reached by EPA's report on Love Canal. A close examination reveals that the data do not justify the much publicized conclusion, that the declaration area is habitable. This is very unfortunate from our point of view not only from the residents and the people affected in the Niagara Falls area, but because Love Canal is the showcase in hazardous waste. We fear that the unsupported conclusions of that report are going to be misused across the country in claiming that hazardous waste sites do not pose health problems. Our statement goes into some detail about why we have reservations about the report.

I just would make two points. One is that we are as confused as anybody about the events that led up to the report's conclusion and second we, after going over the report with a fine tooth comb have a lot of reservation about the methodologies used for data collection and data analysis. EPA claims to have followed well-known guidelines of the American Chemical Society for conducting environmental analyses. In fact they have not. I think the whole report undercuts EPA's claims that they are basing their decisions on better science.

Dr. Silbergeld is with me today specifically to respond to any questions you may have on that. She is the one who has gone over this, very, very closely.

We are also disturbed by the lack of accomplishments under the program.

Senator MITCHELL. Could you summarize in a minute or two?

Ms. HALL. I will. It is very hard to get a handle on hard data. But figures available to us as of July 9 indicate that $32 million have been obligated for remedial work. More than twice that had actually been allocated but that does not signify any progress. The $32 million worth of obligation is more reflective of what is actually happening. The critical stage on Superfund cleanups is the remedial investigation feasibility study and that is the planning effort, to go in, to determine what the extent of the problem is, and to lay out some options for remedy. You cannot do a good Superfund cleanup without that happening. As of July 9 only 29 such remedial studies had been begun and 8 have been completed.

Cleanups had started at only two sites and one had been completed. The miserable record of EPA in this area I think demands some answers and some oversight. The possible reasons for delay are, one, the delay and the weak form of the National Contingency Plan. Two, the interaction between enforcement efforts and fund financed cleanup. We are not convinced that there has been good coordination between the two parts and are particularly disturbed that when sites are going through the enforcement process, remedial investigations and feasibility studies are not being conducted. That is a valuable body of data to be used for negotiations. It would not be wasted money. It puts EPA in the best possible position to go on to fund finance cleaning up if negotiations break down.

Lack of EPA personnel is a problem. Headquarters personnel are stretched thin. EPA's own documents say that for both enforcement efforts and fund financing.

Senator **Mitchell**. Thank you very much, Ms. Hall. I appreciate it. I am sorry to hurry you along. But as you realize there are other witnesses who will want to have an opportunity to make their statements.

The next witness is Jay Hair, executive vice president, National Wildlife Federation.

Welcome Dr. Hair. Your statement will be inserted in full in the record.

This is a 5-minute hour glass.

STATEMENT OF JAY D. HAIR

Mr. **Hair**. Less 15 seconds, Senator. You just took 10 seconds.

Thank you for this opportunity to present these remarks on behalf of the National Wildlife Federation.

Since other witnesses are addressing other aspects of the National Contingency Plan and Superfund Implementation, I will restrict my remarks to one important issue which has unfortunately not received the attention it deserves. I refer to the responsibility Congress vested in the executive branch under section 301(c)(1) of CERCLA to develop regulations within 2 years for assessing damages for injury to natural resources resulting from oil and hazardous substance releases. Despite the critical need for such damage assessment regulations, and with the statutory deadline barely half-a-year away, virtually nothing has been done to even begin the mandated rulemaking process.

Responsibility as you know has been delegated by the President to the Secretary of the Interior.

It is tempting and understandable to ignore or subordinate concerns about fish and wildlife and other natural resources to the very dramatic and tragic direct impacts of hazardous wastes on human health and welfare. The victims of Love Canal and other shameful episodes have a clear claim on the American conscience and must receive priority attention. However, we dare not forget our place in the web of life or neglect the terrible toll that hazardous waste releases have had on other specieis and on the habitat we share.

In the annals of hazardous waste infamy the James River Kepone disaster, which primarily affected fish and shellfish—and the fishing industries they supported—surely deserves no less prominent attention than episodes like Love Canal and Valley of the Drums.

I worry greatly about the role of hazardous wastes in human cancer and disease. But I am, if possible, even more troubled by the chronic contamination of our environment and our food chain with chemicals which thwart the ability of birds and mammals and other species to reproduce and perpetuate their kind.

The peregrine falcon, the brown pelican, and other species, were brought to the brink of extinction by the careless use and disposal of toxic chemicals. Although some among us might not mourn the passing of these creatures, we must remember that the basic biochemistry of the species that have suffered reproductive impairments upon exposure to persistent chlorinated organic chemicals differs little from our own.

My prepared statement documents the extent and significance of hazardous waste damage to natural resources. This committee recognized the pervasiveness of this problem 2 years ago and in reporting out the Superfund bill it concluded "Damage to natural resources due to releases of hazardous wastes is a very serious problem" with environmental ramifications that "can be regional or national * * * in scope" and both short and long term in extent.

A specific mandate to develop a standardized system for addressing natural resource damage, "which is efficient as to both time and cost," was included in the bill because of the clear "need for an improved, fair and expeditious mechanism for dealing with natural resource damages caused by releases of hazardous materials." The committee felt that the need could be met only through standardized regulations developed "after a thorough review of alternatives for damage assessment" and designed to select "the best simplified procedures for making accurate and defensible assessments of resource damages."

The consequence of the the Department of Interior's failure to pursue the development of damage assessment regulations in a timely manner is, therefore, the lack of clear guidance for doing cost-effective field assessments and for doing accurate and efficient monetary cost assessments. This inevitably leads to one of two undesirable results.

Either inefficient and inaccurate assessments will be done—which will require a needlessly large expenditure of time and resources to complete and constantly repeat for each separate site or release that is investigated. Or—and this, is far more likely—it will mean that natural resource damages will remain uncompensated and unredressed.

This concern is bolstered by the fact that the National Contingency Plan [NCP] directs the natural resource trustee agencies to assess natural resource damages in accordance with the damage assessment regulations mandated by section 301(C)(1). In the absence of these regulations, the NCP could be read to preclude any such damage assessments.

We were shocked and dismayed to discover that Interior has done virtually nothing to carry out this regulation writing responsibility. I wrote Secretary of the Interior James Watt on July 12 to express our sense of alarm and disappointment over this unfortunate situation. Our letter also requested that the Secretary provide us with detailed information on the status of the Interior's efforts to implement the rulewriting task. I have as yet received no reply.

I hope this subcommittee will seek a full report from Secretary Watt on this matter.

Although lack of adequate funding is the reason given for this deplorable lack of action, we have seen no evidence of any effort to acquire the needed funds apart from a protracted battle among the lawyers at EPA and Interior over whether trust fund moneys can lawfully be used to underwrite the administrative costs of writing damage assessment regulations. Specifically, the EPA General Counsel opined—more than a year ago, on June 30, 1982—that there is no authority in CERCLA to pay the costs associated with section 301(c)(1), which is a title III activity, since section 111(a) permits payment out of the fund only for those administrative costs reasonably necessary for and incidental to implementation of title I of CERCLA. This legal opinion was quickly followed, on July 24, 1981, by a diametrically opposite legal opinion from Interior's Associate Solicitor for Conservation and Wildlife.

More recently, EPA's Associate Administrator for Legal and Enforcement Counsel and General Counsel, in a June 21, 1982, memorandum reiterated the EPA position, specifically rejecting the Interior Department's legal analysis.

Regardless of whose lawyers were right, I find it incredible that a full year was wasted because of unproductive haggling among agency lawyers.

I understand that Interior has now reluctantly and belatedly resigned itself to making provision for the needed funding in its own budget for fiscal year 1984. The utter inadequacy of this step is evident from the fact that it does not allow the rule-writing process to even begin for another 14 months. Meanwhile, the 2-year deadline specified in the act will expire on December 11 of this year.

The irony of all this is that the necessary funds apparently amount to only about $300,000.

My recommendation to this subcommittee is that it convey to the Secretary of the Interior in the strongest terms its desire to see section 301(c)(1) implemented as rapidly and aggressively as possible. The Secretary should be encouraged to pursue all available means of securing immediate funding to develop and promulgate legally required damage assessment regulations. Available means which should be pursued include reprogramming of the modest funding levels needed from budgeted but dispensable resource development activities.

If necessary to get the rule development effort underway more quickly, EPA should be urged to advance the needed moneys from the trust fund—subject to later reimbursement by Interior. This would be a wholly proper use of trust fund moneys since the development of damage assessment regulations for natural resources is reasonably necessary to effective implementation of natural resource protection responsibilities under title I as well as under title III. Repayment of these outlays to the fund should accommodate EPA's concerns and insure that maximum resources remain available for emergency response and cleanup functions.

In conclusion, I commend this subcommittee and committee for your important efforts to secure vital legal protections for natural resources which are damaged or threatened by hazardous waste releases. I hope and trust that you will not allow the Interior Department to undo these efforts through inaction.

Thank you for the opportunity to present these views.

Senator MITCHELL. Thank you, Dr. Hair.

The next witness will be George Tyler, assistant commissioner, New Jersey Department of Environmental Protection.

Welcome and I ask you to summarize your statement in 5 minutes.

STATEMENT OF GEORGE J. TYLER

Mr. TYLER. Thank you, Senator.

I especially appreciate the consideration you extended to us in holding this extra time for us.

Senator Chafee, members of the committee, I want to thank you for the opportunity to present New Jersey's observations concerning the implementation of the Comprehensive Environmental Response, Compensation and Liability Act of 1981, commonly referred to as Superfund, and to share with you some of the problems that we can otherwise expect to encounter during the continued implementation of this enormously important environmental program.

New Jersey is in fact the third State in the Nation in industrial chemical output and as a result we were among the first to realize the need for Superfund-type legislation and in fact in 1977, passed our own form of superfund.

We were also one of the first States in the Nation to provide the Federal Government with a list and detailed examination of the sites in New Jersey which we believe to be in desparate need of Superfund action.

This brings us to the central question before the committee this morning, namely, why for 2 years the Federal Government has not yet fully implemented the components of the Superfund for getting actual cleanups underway.

At the present time we are in the midst of negotiating cooperative agreements with the EPA under the Superfund, 12 sites that were originally placed on the interim national priority list.

We have successfully completed negotiations and signed agreements now on three sites, on one site, we had a pre-Superfund agreement signed by RCRA and we are in active negotiations on the six additional sites.

What we have come to face are five legal points which I would like to put before the committee for your consideration, technical amendments to the Superfund law.

These legal issues are substantial roadblocks to ready implementation of the law for getting cleanup underway.

The first issue is the preemption issue for State funds. The language in the Superfund law has been clarified now by three judicial decisions, two Federal and one State, tax court decision.

We are awaiting a second State tax court decision. The point I want to make is that the lack of clarity around the preemption question has caused New Jersey and I am sure the Federal Government to expend substantial resources that could otherwise be devoted to cleanup.

The second issue I raise is with respect to the 10-percent State matching share. The Federal bureaucracy has almost ground to a halt at times over the precise 10-percent decimal point figure that needs to be matched under the Superfund law.

I would suggest that at some point in time, Congress consider more flexibility for Federal Government in accepting programs somewhat less than 10 percent.

I am not suggesting that the State shouldn't contribute approximately 10 percent. It is the flexibility of the Federal negotiating position that I am addressing.

The key issue for New Jersey and I am sure for other States if they get to this point, and the most important one, is the issue of maintenance.

The present interpretation of the New Jersey Attorney General and our legal staff in the Department of Environmental Protection said that the maintenance provision of the Superfund stipulates that the 90-10 formula, 90 percent Federal, plus 10-percent State cost, will attach throughout the maintenance period during the site.

The Federal Government has taken the position that the States are responsible for 100 percent of the maintenance costs.

This creates two problems. One is clearly just a fiscal problem. We view Superfund as a resource to assist us with what we consider to be a massive hazardous waste cleanup problem. One-hundred percent maintenance cost on the States may turn out to be a dire impediment to cleanups going forward because States cannot commit those kinds of dollars in many cases.

We are fortunate in New Jersey to have some bond funds available.

We have some 350 sites we would like to deal with. So that bond issue that we have available could be used and the States compensation fund should be stretched as far as possible.

We think the Superfund law and the congressional intent was that the 90-10 formula attachment. I cannot emphasize enough how much we would like to see that original congressional intent clarified, either in an amendment or some other way.

The fourth is a related issue, both with maintenance and the 10-percent cost share.

It is very difficult sometimes constitutionally and not permissible for the State officials to commit to an open-ended 10 percent without a specific sum in mind.

Again, The Federal legal position is that the States must commit 10 percent no matter what 10 percent adds up to. It is very difficult for a State treasurer or State Attorney General to certify that.

Again, I would suggest a technical amendment that allows a State to stipulate to its recipient sum and allows the proper agreement to provide for future negotiation if there are costs beyond that.

The last point with respect to technical changes that would be helpful is the issue where it is used in Superfund to describe what States have to do vis-a-vis waste disposal sites.

The terms is used now, that the State must make disposal sites available. It doesn't say who has to pay for those sites or whether or not the site will in fact be in the State where the cleanup is taking place.

This gives again legal problems to the negotiators and becomes an impediment to moving forward to cleanup. Again we suggest that you clarify the available means, so that the State government is responsible for locating and assuring that the site is available somewhere and will be used in accordance with the 90-10 cost-sharing formula.

The major issue, I could not overemphasize, it has been amply discussed today, is the issue of the quality of the national contingency plan.

We are submitting to EPA substantial comments which we urge this committee to consider in reviewing the present plan versus the proposed plan and in the Congressional Oversight of those Federal regulations.

Senator MITCHELL. Mr. Tyler, your time has run out.

Do you have one major point you want to make in conclusion?

Mr. TYLER. Yes; the last thing I would like to say is if I had been called here to testify a month or two ago I would have been extremely critical, I think, of the Federal activity in the Superfund. However, we have seen very strong commitment, I think, in recent months and weeks with respect to moving on cleanups that are ready to go in New Jersey.

We are in the process now of negotiating as I said six additional cooperative agreements. We are very pleased with the cooperation that we are getting at this point in time. We urge the committee to continue its oversight of this process.

We will be glad to report back to you on how we are doing with the other cleanups we would look forward to in the next month or so. Thank you.

Senator MITCHELL. Thank you, Mr. Tyler.

The next witness will be Jeff Diver, who is with Waste Management, Inc., representing that solid waste management association.

Welcome. We look forward to your 5-minute summary of your testimony.

STATEMENT OF JEFFREY R. DIVER

Mr. DIVER. Thank you.

I hope I can get through this in substantially less time.

Senator MITCHELL. Those who end before the sands expire get special attention paid to their testimony.

Mr. DIVER. I expected that would be true.

I am representing today the Institute of Chemical Waste Management, which is one of the institutes of the National Solid Waste Management Association. The 17 members of the institute are primarily engaged in the transportation, storage, treatment and disposal of hazardous wastes and other hazardous things that Congress has determined through one statute or another to regulate.

We are in a sense observers of the Superfund program; that is, our facilities in transportation capabilities are used in implementing the program when contract services are called for and some of our companies actually provide for contract removal and remedial action.

We obviously have an economic interest in going forward with the Federal program. We are going to try as best we can to put that aside in these comments. Five points are to be made:

First, that the statute itself establishes an illogically small number as the reportable quantity for hazardous substances that are delineated statutorily, which are not covered by the Clean Water Act.

Today we have a situation in which if someone were to spill a pound of asbestos containing pipe insulation, a pound of any compound that had silver in it in any quantity at all, a pound of hazardous waste during the loading or unloading of a vehicle, all of those incidents would trigger the requirement under the Act today for a report being made to the National Response Center.

We don't think that the statute was intended to operate in that fashion but that EPA was required to as the statute provides establish meaningful reasonable reportable quantities for all of those hazardous substances not covered by the Clean Water Act.

That hasn't been done to date. EPA did establish a draft. The last draft that actually had been developed was in June of 1981 of an intermediate policy, interim policy that would cover redefinition of the reportable quantity itself and an explanation of when reports would be required.

We think it is very important to make sense out of the program; that USEPA complete that draft, institute some kind of interim policy and get about the business of establishing reportable quantities which Congress had thought it was going to accomplish.

The second matter, two rather modest suggestions and the implementation of the program.

First, with respect to settlement policy, one of the things that we say today, you have been given some documentation from the USEPA indicating there are negotiations now on some 64 sites and that 1,250,000 letters have gone out which is the beginning of the settlement of the enforcement process.

One of the things we are saying is that settlements are getting bogged down in what I best could describe as lawyers games.

It is nowhere no longer focusing on the cleanup of the environment in the most expeditious fashion but rather trying to hide our cards as best we can from the other side and hope that somehow they will make the concession not knowing what information exactly it is that I have.

For example, when the notice letter was sent out, the first thing it tells the recipient is you are a little party in the Superfund. It gives you the name of someone to call to turn yourself in and immediately begin the process of cleaning up the site that has been identified.

When you call to find out what it is exactly that you are alleged to have done you are told you will not be able to find that out.

We are not going to share that information with you. If the Freedom of Information Act request is filed, it won't be honored because this matter is under litigation or enforcement.

This appears to be juvenile, that if the parties are really interested in settling these matters, lay all the cards on the table, establish the meaningful deadlines for the conduct of settlement, and if settlement is not accomplished within the period specified, commence Superfund action, if you actually have the plan ready for the facility and simultaneously commence litigation against those parties this had not settled.

Second modest suggestion: With respect to emergency response actions, these are the actions that ordinarily are unplanned. They are really supposed to be the true emergency, something happened right now that has got to be cleaned up right now or devastating effects will occur.

Emergency response declarations are now being made with a host of sites that really don't have any significant immediate environmental or human health effect to them.

Primarily for the reason that it is politics or publicity can be gained by having the declaration. It looks like something is happening when a site is declared to be a candidate for emergency response regardless of whether or not it actually presents an emergency.

We think this is not a good way to spend Superfund program talents; time that is taken to address those facilities and if an emergency is not carried they ought to be carried under the plan provisions for removal under the contingency plan.

I see that the sands of time have rapidly run out.

Senator MITCHELL. This goes faster when you are talking than when you listen.

Mr. DIVER. Let me make one last point.

Senator MITCHELL. I have spent most of my life as a trial lawyer, tried hundreds of cases and I thought every one was the most fascinating thing in the world.

Then I became a judge and, my God, how my interest went.

You go ahead and finish up.

Mr. DIVER. The last point I want to make is this: We are obviously focusing on the purpose of this hearing today which is two-fold.

The Superfund law is intended to correct the mistakes of the past. However, we also have a statute whose purpose it is to make sure that we don't repeat the mistakes of the past; that is, the resource conservation recovery act.

We are concerned periodically that so much attention is focused on the Superfund area that RCRA gets neglected, that the time, personnel, budgetary resources that are necessary to establish and inplement quickly a program to assure that what we are doing today does not look like what we did yesterday and now are having to clean up through the Superfund law.

Senator MITCHELL. Are the laws exclusive? Does the enforcement of one law necessarily require the nonenforcement of another law?

Mr. DIVER. No; it obviously does not. But when in particular the mandate is in the same agency and here we have the situation where there can be a tendency depending on what is the particular stress is today to focus resources in one area.

If resources are constant, that means resources are taken away from the other area. We are already hearing about the fact it is going to take 5, 10, 15 years to issue permits to all of the facilities that now exist that are managing hazardous wastes in this country.

One of the reasons we suspect for that is a need to put resources on the Superfund program. We are not suggesting for a moment that the resources totally that the agency has are those that are needed to implement both.

We have to remind people constantly that we cannot in the prioritization of our Nation's problems assume as our first priority the correction of something bad that happened, our first priority ought to make sure that whatever exists today doesn't get any worse.

The only way that that can be done is by focusing the resources in the Resource Conservation Recovery Act. Thank you.

Senator MITCHELL. Thank you, Mr. Diver.

The final witness of the panel will be Dan McGrade, who is with Stauffer Chemical, representing the Chemical Manufacturers Association.

Mr. McGrade.

STATEMENT OF DANIEL McGRADE

Mr. McGRADE. Thank you, Mr. Chairman.

I am Manager of Environmental Control with the Stauffer Chemical Co., and I will testify today on behalf of the Chemical Manufacturers Association, a nonprofit trade association, whose members—including Stauffer—represent more than 90 percent of the productive capacity of basic industrial chemicals within this country.

CMA's member companies are directly and materially affected by the Federal Superfund law. We are the prime contributors to the $1.6 billion fund. We are often among the parties that the Government seeks to hold financially liable in specific waste site cleanup activities.

Mr. Chairman, CMA strongly supports prompt implementation of the national program under Superfund to remedy problems created by inactive waste sites.

Our industry is committed to working with the Federal and State Governments under the framework of Superfund to assure that appropriate action will be taken which protects public health and the environment.

We believe that the basic structure of Superfund offers a rational and focused approach for assessing the scope of the national problem and addressing the problem efficiently. Superfund mandates that EPA grapple with extremely complex problems for which little information has been made available. We think that EPA has made good progress and laid firm foundations which will promote efficient rational approaches to solving the problems.

Mr. Chairman, one achievement is that the scope of the problem is better defined than 2 years ago. Then there was considerable public concern over the potential for harm from a few well-publicized dump sites. The concern was hightened when certain officials indicated that there may be 30,000 to 50,000 such dangerous waste sites. We are now developing a much better grasp on the true nature of the problem. We now know that the public fears about the extent of the problem were based upon inflated and unsupportable numbers.

The Superfund statute sets up an orderly framework for assessing the true scope of the problem. Under the section 103(c) site notification program EPA is to develop an inventory of all sites at which hazardous substances have been stored, treated, or disposed. EPA has completed this inventory and we understand that the inventory contains about 9,600 sites.

After EPA completes its inventory, Superfund then calls for an orderly process of assessing the nature of the potential harm from these sites and setting priorities for them.

This will allow the national effort to focus on the true problems. Based upon the number of candidate sites reported by the States to date, we believe that only a fraction of the 9,600 sites will be found to pose real threats to human health and the environment and warrant significant remedial action.

We are not saying, Mr. Chairman, that there are no significant potential health and environmental problems from inactive hazardous waste sites. We are saying that we believe that the problem is much more limited and manageable than generally believed before Superfund became law. We also believe that the problems can be efficiently addressed and put behind us with sensible administration of Superfund. We have time to do this in an orderly fashion from an environmental standpoint.

These sites do not generally present real emergencies. We can figure out the right thing to do for the long range. Then we can do it, thereby assuring the best environmental solution.

For those cases where a true emergency does exist, the Superfund statute and other existing laws provide ample mechanisms for quick and effective abatement action.

A second achievement is that EPA has published a list of 115 sites and has begun addressing the problems on most of these sites. In addition, EPA recently identified 45 more sites that will be considered for cleanup under Superfund.

Another achievement of significance is EPA's recent amendments to the National Contingency Plan, which faithfully track the basic statutory framework.

The plan generally offers a rational, cost-effective approach for assessing relative risks, prioritizing sites, and selecting appropriate remedies. In this plan, EPA has recognized the need for flexibility in selecting remedies. EPA has wisely recognized that each problem site will have unique hydrologic, geologic, environmental and waste characteristics and any attempt to develop detailed criteria to account for all the possible permutations would create unnecessary delays in implementation of Superfund. Now that EPA has laid the basic foundations for its remedial response program, we encourage EPA to undertake full implementation of the program with vigor.

Mr. Chairman, we also believe that EPA is basically taking the most productive approach to waste site remedies where financially responsible parties are potentially liable. EPA's approach, which is fully consistent with Superfund, is to try first to obtain administrative settlements from parties negotiating in good faith, and to initiate costly and time-consuming lawsuits only if such settlement attempts prove unsuccessful.

We believe that EPA's approach will result in more timely, efficient, and environmentally protective results than the confrontational "litigate first" approach. To date EPA has gained private party support for cleanups at about 20 percent of the sites and we expect more as the settlement process is refined.

Mr. Chairman, I can speak personally to the benefits of such an approach, based upon a recent example from my own company. Stauffer Chemical Co. until the late sixties operated a glue manufacturing plant at Woburn, Mass. Other parties had conducted manufacturing operations on the site before Stauffer bought it. Stauffer sold the site after it closed the plant.

Last October, EPA listed the Woburn site as one of the interim 115 top priority Superfund sites. On May 25, 1982, Stauffer entered into a consent agreement with EPA to conduct a site investigation and develop remedial alternatives. We have already begun the field work on the first phase of the investigation and expect to complete it by the end of this year at a cost to the company of about $1 million. In conducting the negotiations leading to the settlement, EPA actively sought the participation of local citizens, the State of Massachusetts, municipal authorities, and other affected parties. These parties participated actively in the negotiations and are currently participating activety in the implementation of the agreement.

The Woburn agreement, I believe, demonstrates that cooperation rather than confrontation can result in prompt, efficient and effective action which is the intent of Superfund.

Mr. Chairman, I have been generally positive thus far about Superfund and EPA's implementation. This does not mean, however, that we are satisfied in all respects either with the statute or with EPA's implementation. As I indicated earlier, we are watching many aspects of the program closely and will continue to express our concerns where we see problems.

For instance, we now have concerns about EPA's policies and procedures for conducting negotiations with potentially responsible parties.

While EPA has accomplished fair settlements in some important cases like the Woburn example I mentioned earlier, we fear that in other cases—especially cases where many parties are involved—EPA has not yet developed adequate procedures to promote rapid, good faith settlements. We are also concerned that EPA, by clearly misreading Congress' intent with respect to preemption, is promoting unfair duplicative State taxation of our industry and overlapping efforts in cleaning up sites.

In closing, Mr. Chairman, I should stress that we believe that this program is important, that EPA is on the right track, and that EPA deserves this subcommittee's support in implementing its program.

The success of Superfund and EPA should not be judged by the amount of fund money spent at this date. EPA should be judged on the number of problem sites that are being addressed, and the effectiveness of the remedies that are developed.

We believe that rational use of the fund and the enforcement authorities in Superfund should prove that the problems with inactive waste sites can be put behind us.

I thank you for the opportunity to testify, and would be pleased to answer any questions you may have.

Senator MITCHELL. Thank you, Mr. McGrade.

I have just a couple of questions.

The first one I will ask in behalf of Senator Stafford, who is the chairman of the committee and could not be present for this portion of the hearing.

Senator Stafford's question is directed to you, Dr. Hair. It is—I will read it—it has been given to me by a member of Senator Stafford's staff:

> Although the Superfund law relies primarily on the governmental entities to respond to releases, specific provision is made for third parties to also respond. Under section 107, a third party can collect its response costs from the responsible party. If the implementation of the law's special litigation tends to move slowly, is the National Wildlife Federation willing to spend some response money and then file suit to collect its costs thus establishing it as a legal precedent?

Dr. HAIR. I think we would certainly want to look at that very carefully for the incident involved and if the consequences are such that it impacted the health of the American people and other living resources, that it was warranted, yes, we are willing to consider putting that kind of commitment forward. We would look very carefully at the potential for setting an important national precedent in doing that.

Senator MITCHELL. Thank you.

I am going to ask two questions which run together. Then I will ask each member of the panel to comment briefly on this.

Some of you have touched upon them in your response. I would like to get a response. The questions involve really a broader general view of the law, and its implementation, than had been dealt with in the testimony.

They are, did you all have different views on the law and indeed different interests in it which is one of the reasons why you are here representing divergent interests?

You are all affected, however, by the manner in which the EPA implements the law. I would like each of you to give me your assessment, a brief one, but nonetheless stating what you believe to be the adequacy or inadequacy of the EPA effort, the amount of resources devoted to carrying out the requirements of this law to date.

Then second, I know some of you, particularly Mr. McGrade has already touched on that, but I will ask him to do it again, but second, as part of the same answer, as you know, the law sets in place a mechanism for the collection of fees which are intended to generate a total of $1.6 billion over a 5-year period. I would like each of you to the extent you can to give me your judgment as to the adequacy of this amount, deal with what we know are hazardous waste sites, in what we do not know, unanticipated releases of hazardous substances.

I think we will go in reverse order this time. So Mr. McGrade, I will ask you to lead off and give me your brief comments, just a couple of minutes each.

Mr. MCGRADE. As I said earlier, we think that EPA is on the right track with the Superfund implementation. We think that they are providing adequate resources toward the problem. And I think that their approach of trying to get the responsible parties to participate in the cleanup operations prior to expending Superfund money is an approach that will result in more cleanups and more truly abandoned sites being addressed.

As for the mechanism for collection of fees and the adequacy of the fund, as I said earlier, I believe that we are now getting a better handle on the scope of the problem. We still need to do some more investigation work on this. But I think that as more responsible parties come forward to pay for the cleanups, their portions of the cleanups, that we will find that the truly abandoned sites that require the fund money will be substantially less than originally anticipated and that the fund will be adequate.

Senator MITCHELL. Thank you, Mr. McGrade.

Mr. Diver?

Mr. DIVER. Yes, Senator. I have to share much the same remarks as Mr. Tyler made, that is, that if you had asked that question 6 months ago, or even 2 months ago, the nature of our response would have been different. However, we do see that U.S. EPA is making movement, taking strides to implement a program and trying at least at this point. The inadequacy of the program, as we see it now, seems to be more in the ability to work the kinks out, to develop a full smooth-flowing program that will ultimately get the sites corrected, be it through litigation or direct expenditure with later seeking cost recovery from the liable parties.

As I indicated in my prepared remarks earlier, the settlement policy right now seems to be more intended to procrastinate, to drag things out, to have lawyers arguing with one another about rather inconsequential matters while the site languishes.

Senator MITCHELL. Almost every law we pass, Mr. Diver, becomes a lawyers' WPA.

Mr. DIVER. I understand that. With respect to collection of the fees on whether $1.6 billion is adequate or not, I suspect it probably is. I say that because I believe that in most of the circumstances the Federal Government is going to be able to find one or more liable parties.

The parties in the reverse instances will determine it will probably be cheaper for them to go ahead with the action than to have the Government do it in the first place. So I would suspect the $1.6 billion is going to be around for some time because of that fact.

Senator MITCHELL. Thank you.

Mr. Tyler.

Mr. TYLER. Thank you, Senator. I think I answered in part that question in my testimony. I think again as was just said a few months ago we would have said there are severe problems. We are at the point now in New Jersey where we are working very diligently to deal with those first 12 sites and will be quickly moving to the next 5 that have just been added to the list. We will be glad to monitor EPA's progress for you and come back and report again.

With respect to the adequacy of the fund I am far less optimistic with respect to the collection against liable parties. We have had, I think, some considerable litigation in New Jersey in attempting to collect. By and large where there are parties that are not judged approved, they are certainly not adequately endowed to cover the entire cost of cleanup. They usually have a small percentage and it comes down to who inherited the estate or something like that. So I don't suspect that those funds will be sufficient. In fact New Jersey has been on record for many years lobbying for a much more substantial Superfund, as I recall $4.2 billion.

So I just don't think that those resources are going to be adequate over the long term, especially with respect to the maintenance of these sites.

Senator Mitchell. Thank you, Mr. Tyler.

Dr. Hair?

Dr. HAIR. Senator, as you know the National Wildlife Federation has tried to take an objective look on the Environmental Protection Agency programs particularly under the administration of Ms. Gorsuch. I would have to say that our conclusion is that Superfund and the action of the Agency on Superfund is basically consistent with the vast majority of other policy measures coming out of EPA under this administration, and that is basically to cut the budget, to cut the personnel; contrary to what they say, we know they are going to do less with less.

We see no enforcement. Quite frankly we see no real Agency resolve and it is now only as we see the political shadows of November starting to loom heavy on the horizon that we see the Agency and this administration showing any resolve to provide some basic protection to the environment of the American people. I come from North Carolina. I can speak directly to a Superfund issue in that State for an incident that happened almost 5 years ago. That was a midnight dumping of PBC's along the highway.

Individuals involved have now been prosecuted by the State and it is only now that we are starting to see the money coming from EPA to clean up the roadside. The adequacy of the amount of money that this legislation will generate for the short run may be enough. But I think when we get into full implementation $1.6 billion or $5.6 billion will probably not be enough to clean up all the toxic dump problems that we have created over the last several years.

Senator MITCHELL. Thank you, Dr. Hair.

Ms. Hall, we will give you the final word.

Ms. HALL. Thank you.

As my statement said we too believe that EPA's progress under Superfund has been much too slow. The National Contingency Plan was over a year later and the EPA's own figures just don't justify the cliams that they are making good progress in the area. We too have become aware that in very, very recent weeks there is more movement than previously. My suggestion would be to set up some sort of public tracking system of each of the 170 sites so that the public, Congress, everybody knows what is going on in each of these States and can make their own assessment of what is happening instead of relying on inconclusive, incomplete summary of the numbers put forward by EPA without any backup.

As to the adequacy of the fund I think Congress acknowledged itself when it passed Superfund in the waning moments of the last Congress that $1.6 billion was probably inadequate. Experience to date is very small but I think it bears that out. EPA's own thinking now being done privately is that $1.6 billion may just barely, if at all, be adequate to address the 170 that are on the list. They are going to have to obviously bite the bullet in a couple of years in trying to decide whether to make a recommendation to come forward with more funding or not. But as I understand, EPA itself has begun to think that $1.6 billion is not going to address 400 let alone 170.

That $1.6 billion is not enough if the health program that Superfund contemplates is put into place. It costs a lot of money to do good epidemiological studies, just to collect the basic data needed to make judgments on how the health of the public is being affected by releases of hazardous substances.

In addition, and we understand and agree with Mr. Tyler from New Jersey that this O&M problem has been a major factor in holding up progress in the Superfund, but if it is included as part of the Superfund responsibility that it is going to stretch that $1.6-billion fund even further. I think it would cause even more doubt whether it will be adequate or not.

Senator MITCHELL. Thank you, Ms. Hall. Thank you ladies and gentlemen. Your testimony has been very informative and interesting and I am sure will be reviewed by all members of the committee with great care.

The hearing is now adjourned.

[Whereupon, at 1:25 p.m., the hearing was recessed to reconvene at the call of the Chair.]

[Statements submitted for the record follow:]

STATEMENT OF
RITA M. LAVELLE
ASSISTANT ADMINISTRATOR FOR
SOLID WASTE AND EMERGENCY RESPONSE
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

AUGUST 4, 1982

Mr. Chairman, it is a pleasure to appear before your Committee to report on EPA's progress in implementing the Superfund program established under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). With me today are Dr. Courtney Riordan, Acting Assistant Administrator for Research and Development, Bill Hedeman, Director of the Office of Emergency and Remedial Response, and Gene Lucero, Acting Director of the Office of Waste Programs Enforcement.

It has been more than a year since the Agency reported to you on Superfund. I am pleased to have this opportunity to bring you up to date on our accomplishments since then. Our first year was devoted to developing and putting into place necessary and somewhat innovative systems as well as a strong policy and regulatory framework. Building on this base we are now moving at an ever increasing pace into field work and remedial solution construction at numerous sites across the nation. I can sit here before you today and say EPA, working with the states, has ensured through 76 emergency removal actions that all those sites present no imminent hazard to local citizens. And that furthermore, by the end of this year, EPA, working with the states, will have completed an initial survey of the universe of potential sites as we know them -- categorizing, prioritizing and investigating them for any necessary action.

In short, Mr. Chairman, while some would charge EPA has not moved fast enough nor spent money quickly enough, we hope to clarify the situation today by demonstrating that those criticisms are unwarranted. In fact, EPA is building a remarkable record of results in its commitment to clean up abandoned waste sites that pose a hazardous threat to the citizens of this country.

ENFORCEMENT EFFORTS

The Agency interprets the CERCLA statute as requiring aggressive action by EPA to compel cleanup by responsible parties prior to any Fund expenditures, so long as private party cleanup can be accomplished in a timely and effective manner.

CERCLA gives the Agency a wide variety of enforcement authorities with which to compel effective action by responsible parties in cleaning up hazardous waste emergencies and sites. During the last year, the Agency has made significant progress in successfully negotiating agreements for existing cases, as well as developing new CERCLA enforcement guidelines and identifying responsible parties at priority sites so that new negotiations can commence and private party cleanup can be obtained.

Since its inception in 1979, the Agency's "imminent hazard" enforcement program has led to the filing of 63 RCRA or CERCLA cases through the Department of Justice. Twenty-two of the cases involve sites on the original or expanded Interim Priority List. In the "Quantico Guidelines" developed this spring, the Agency and the Department of Justice reaffirmed that the conclusion of existing cases will be one of our highest priorities. We are indeed making progress in this area; the Agency and DOJ have negotiated a total of 20 settlements overall, including ten so far in 1982. All told, the total value of privately-financed cleanup over the life of the "imminent hazard" enforcement program is an estimated $82 million.

The CERCLA enforcement effort combines initial constructive negotiations with those responsible parties who are willing to participate in the site cleanup effort with appropriate action against those violators who refuse to undertake necessary response measures.

While this enforcement action is continuing, the Fund would be ready to address the needed phase of site response if the Agency believes that cleanup should no longer be delayed.

This process allows for an Administrative enforcement program through which the Agency can secure private party action in a more expeditious and less time consuming manner than moving immediately to formal civil litigation. It also retains the Agency's ability to initiate civil action against recalcitrant responsible parties where appropriate.

Normally, the time period for negotiations with responsible parties will last no longer than 60 days and can be less if the team believes that continued negotiations are unlikely to be successful. At the start of negotiations, the parties are told of their liability for all costs incurred by the Fund and that the Agency may use its enforcement authorities, including both administrative orders -- with their possiblity of treble damages -- and civil action should they refuse to clean up a site. This process assures that priority sites will be addressed either by the Fund or by private party action in a reasonable period of time.

In order to inform responsible parties of their potential liabilities and to encourage the prompt initiation of negotiation, the Agency has issued "notice letters" to over 1,250 parties for 83 sites on the Interim Priority List. These letters both give responsible parties an opportunity to confer with EPA officials concerning site cleanup and serve as useful evidence when the Agency goes to court to recover funds from parties who were given the chance to cleanup the site, but refused.

So far, the Agency has scheduled or is currently involved in negotiations at about 46 priority sites and has concluded negotiations at about 18 sites. We expect more of the on-going negotiations to be concluded. "In-progress" planning work at some sites is finished and the extent of the final site remedy is known.

As a result of the "notice letter" process, the Agency has secured cleanup commitments for five priority sites, two of which have been ratified through consent decrees and one through the issuance of the CERCLA Section 106 Administrative Order.

During the remainder of the year, the Agency will emphasize the remaining scheduling of meetings with responsible parties in an effort to secure the maximum feasible amount of privately-financed cleanup. In addition, the Agency is in the final stages of issuing guidance on the use of the CERCLA Section 106 Administrative Order and civil action authorities, as well as guidance on both procedures for cost recovery of Fund expenditures and the coordination of Federal and state enforcement efforts. These policy memoranda are scheduled to be issued by the end of the Summer.

In summary, the Agency is moving forward aggressively with its CERCLA enforcement program in accordance with its mandate from Congress: to secure privately-financed site cleanup where feasible, so that the Fund can be used to address a larger number of "orphaned" or abandoned sites.

Fund-financed Actions

When responsible parties have shown themselves unwilling or unable to act in a timely manner to start the cleanup of a site, the Agency has not hesitated to begin the cleanup effort with Trust Fund monies. To date, we have taken the following actions:

First, funds have been allocated for remedial action at 58 sites for a total proposed allocation in excess of $63 million. Of that amount, more than $37 million has already been obligated. We expected to obligate the remaining amount of allocated funds before the end of the fiscal year.

Second, we have not hesitated to use the emergency authority under CERCLA to authorize 77 emergency response actions costing more than $25 million. These emergency responses range in scale from installation of simple snow fences around a landfill in the Midwest to the cleanup of fire debris left from a major chemical explosion in the South.

Third, the Agency has followed its strategy for expanding a significant part of its available resources in this, the first year and a half of the program, to develop the necessary policy and regulatory framework implementing Superfund. Of course, the cornerstone of this effort is the National Oil and Hazardous Substances Contingency Plan. The NCP was published in final form in the Federal Register on July 16. It represents regulatory reform at its best, providing a flexible framework on which to make decisions on the extent of cleanup at any hazardous-waste site, as well as guidelines for appropriate response roles on behalf of the 13 Federal agencies, States and other involved parties in emergency response efforts. I am proud of the NCP, which is a streamlined document usable by those in the field as well as those at desks.

National Contingency Plan

One of the major issues that arose during the revision of the National Contingency Plan was the development of the State's role in emergency response. Many of the some 150 comments that were received on the NCP related to this issue. The plan now encourages State involvement and delineates State roles in emergency response actions. These roles include working with on-site coordinators in determining the appropriate extent of remedy and participation in Regional Response Teams. Also included is receipt of notification of releases. A new section indicates how States may enter into cooperative agreements or contracts for response actions pursuant to CERCLA.

The degree of State interest in the Superfund program is manifested in the many comments received on the NCP. Additionally, the unexpectedly high number of States willing to take a lead role in the remedial program under Superfund makes apparent the keen interest of the States. A year ago this Agency predicted or targeted State lead roles in 30 percent of the remedial actions taken. Instead, States are taking the lead at remedial sites at an astounding rate of 83 percent. The Agency has so far entered into 23 cooperative agreements for action at those 58 sites cited earlier, with 17 more pending. We expect to involve the States further in other phases of the Superfund program, such as developing cooperative agreements for removal activities.

Another issue in revising the NCP concerned coordination between Federal agencies and the trusteeship responsibility for natural resources. Both NOAA and the Department of Interior expressed great interest in assuming trusteeship roles, supplementing State responsibilities in assessing natural resource damage from hazardous substance emergencies. The Agency determined that in some cases these divisions of responsibilities are neither clear geographically nor statutorily. The Plan proposes that NOAA and the Department of Interior act as trustees in such instances, and encourages the two agencies to enter into a Memorandum of Agreement to delineate further these responsibilities.

Still another issue receiving attention is the distinction between immediate and planned removals. Immediate removals are intended for response to situations threatening immediate and significant harm to human life or health or the environment; these are emergency situations requiring rapid immediate response. Other situations also exist which require an expedited response, but not an immediate one. In these situations, more deliberation can be given to planning the response action. The statutory category of "removal action" covers both situations. EPA believes that such response flexibility is needed to ensure the effective use of Fund money and to achieve the greatest amount of protection for public health and the environment with the funds available.

Another group of NCP comments concerned the Hazard Ranking System (HRS) and development of the National Priority List of 400 hazardous waste sites also mandated under CERCLA.

The hazard ranking system evaluates five primary human health and environmental quality pathways that can be affected by contamination from hazardous waste sites. Two of those pathways -- the one fire and explosion, the other direct contact -- are likely to require immediate removal actions. Three other pathways are groundwater, surface water and air quality. Each site is scored for hazard. The scores are combined statistically to produce an aggregate site score that will be used to compose the National Priority List. The hazard ranking system was first used in developing the Interim Priority List of 115 sites announced by the Agency in October 1981. It has since been modified on the basis of EPA's experience with it, comments from States and Regions, and other comments on the proposed NCP. The hazard ranking system now has been finalized and is the basis for developing the list of 400 National Priority Sites. The Agency intends to propose the list of 400 for public review and comment in the fall.

We have made several basic changes in the hazard ranking system as a result of the comments we received. Background levels will be measured as part of scoring observed releases. The scoring weight of waste quantity has been reduced. Presence of "reportable quantities" is now required to score toxicity or persistence of substances (to address the concern about measuring trace amounts). And natural physical/topographical barriers must be considered in assessing the target populations potentially exposed to contaminated groundwater. Other changes were also made in fine-tuning the system.

Another area that received a fair amount of attention related to responsibilities for cleanup of Federally-owned or managed properties. The Agency's policy on use of Trust Fund monies for cleanup of Federal facilities is derived from the CERCLA law and is stated in recent guidance on developing the 400 list rather than in the NCP. When a facility that represents a hazardous waste threat to public health is identified as Federally-owned or managed, that Federal agency is responsible for providing a remedial solution to the problem. Where contamination appears outside the boundaries of a Federal facility, and where the source of contamination is not clearly established, the Agency is willing to use Trust Fund monies for investigations to establish the source. If the source turns out to be a Federal agency, then no more Trust Fund monies will be available for remedial activity. The Agency has expressed its willingness to work with Federal agencies through the budgetary process to obtain the necessary resources for them to implement responsible cleanup activities.

Another area of concern is the relationship between Superfund actions and the RCRA programs. The move to consolidate these two programs under one Assistant Administrator was an excellent concept. It allows us to design, implement and manage a program that not only cleans up abandoned sites quickly but prevents the formation of new sites. The programmatic interfaces between RCRA and Superfund will soon be the subject of guidance. However, we have taken a position that existing RCRA regulations exempt removal actions, and that for remedial actions we will seek solutions which conform to Federal regulations or to State and local requirements as appropriate in a delegated situation.

Another significant benefit is the exchange of experience between the two programs. On the RCRA side we have benefited in our regulation development efforts - land disposal, establishing degrees of hazards as well as analysis of disposal techniques and procedures which we have suggested would be changed. On the Superfund side we have some excellent R & D efforts aiding us in the field, such as our mobile incinerator, a 2 1/2 hour self-contained, level C protection unit and a mobile carbon filtration system called the "Blue Magoo."

Additionally, the two programs working together will allow us to optimize our technical experiences, encouraging new technologies with expeditious, RCRA permitting.

Other Superfund Activities

As required under Executive Order 12316, EPA chairs an interagency budget task force. This effort is the mechanism for allocating Trust Fund monies to other Federal agencies for Superfund-eligible activities. Three weeks ago, the budget task force discussed guidelines for submission of Agency Superfund budget requests for Fiscal Year 1984. EPA is presently receiving those submissions from the other Federal agencies and intends quickly to review them and establish proposed funding levels for submittal to the Office of Management and Budget for final review.

Love Canal

A major milestone in the Agency's involvement in hazardous waste cleanup was the recent release of the Love Canal study. The Love Canal Environmental Monitoring Study was the largest multi-media environmental monitoring study ever conducted by EPA (more than 6,000 samples collected and analyzed). State-of-the-art sampling and analytical methods were employed throughout. A full-scale hydrogeological study was conducted in addition to multi-media sampling.

The study examined potential and existing contamination within Rings 1 and 2 of the Canal area and within the broader scope of the declaration area, also considered possibly at risk.

As this Committee is aware, the study was released and discussed with the public and concerned residents of the Love Canal area on July 14.

The Agency spent three days in meetings with concerned residents at its Love Canal area office. At the request of residents, EPA returned to the Love Canal area for further discussions during the week of July 26.

The findings from the Environmental Monitoring Study showed that toxic chemicals had migrated from Love Canal and contaminated shallow system groundwater, soil and sumps in the vicinity of some Ring 1 houses. The data also showed substantial contamination in the local storm sewer lines as well as in the sediments of area creeks and the Niagara River at locations near the outfalls of the sewer lines. Apart from these findings, however, no substantial amount of environmental contamination was detected in the declaration area. No patterns could be identified that would link contamination in the declaration area to migration of substances from Love Canal.

The Agency is confident that both the methodology and the results of the Love Canal study can be defended against the most detailed scrutiny. Results obtained from separate monitoring programs confirm one another. There is a clear and consistent multi-media pattern of contamination in the Canal area directly attributable to the migration of substances form Love Canal. However, there is no consistent multi-media contamination pattern in the declaration area directly attributable to migration from Love Canal. These results conform fully to the geology of the site. They also attest to the effective operation of the barrier drain system.

In particular, the outward flow of migrating contaminants has been contained and the direction of near-surface groundwater flow is toward the drains.

EPA does not dispute the contention that there are environmental problems at Love Canal. The most important are the contamination of storm sewers and of creek and river sediments. To address these problems directly, the Agency also has announced a $7 million action program in conjunction with the State of New York to complete the extension of the cap and implement a containment option on the Love Canal site, to sever utilities and to secure the site, and to initiate the feasibility studies, prerequisites to final cleanup of Black creek and other storm sewer outfall problems.

Allow me now to address the critics of this Agency's management of the Superfund program. To meet charges of lagging expenditures and a slow start, we have laid out for you today the history of careful program management and stewardship of Trust

RESPONSES TO SENATOR CHAFEE'S QUESTIONS

Question

1. When the government is involved in cleanup at a hazardous waste site or spill, how do you decide on the proper remedy?

2. How do you make the determination that cleanup is adequate to protect public health?

3. Are criteria and standards for cleanup being development? why not?

Answer

With respect to remedial actions, CERCLA section 104(c)(4) requires the selection of appropriate remedial actions which provide a balance between the need for protection of public health and welfare and the environment at the facility under consideration and the availability of amounts from the Fund established under title II of CERCLA to respond to other sites which present or may present a threat to public health or welfare or the environment, taking into consideration the need for immediate action.

In analyzing remedial action alternatives, EPA requires that the most cost-effective remedy be selected. This selection is based on three criteria:

1. Protection of public health, enviornment and welfare

2. Technical feasibility

3. Cost.

The NCP requires EPA on the basis of this analysis to select the remedy which minimizes and mitrigates and provides adequate protection of public health and welfare and the enviornment. The selection of the appropriate alternative is then done in consultation with the State.

Section 105 of CERCLA requires the NCP to contain methods and criteria for determining the appropriate extent of remedy. These methods are included in section 300.68 of the NCP, along with criteria for remedial decision-making. CERCLA doess not require the development of specific environmental standards and criteria.

Question 4:

Are the states doing their part in site clean-up? Do they have the expertise?

Answer:

There have been 34 Cooperative Agreements signed with the States. An additional 18 are under negotiation or pending.

During the negotiation period, it is essential that the State demonstrate, to the satisfaction of the Agency, that the State has the necessary expertise to handle site clean-up.

Question 5:

Is there a shortage of skilled personnel to dispose of the materials?

Answer

EPA has awarded contracts (Technical Assistance Team contract and two contracts to conduct and perform remedial response activities at uncontrolled hazardous waste sites) to support the EPA response to releases of hazardous substances. The contracts require a program to insure the protection of the health and safety of the on-site worker.

To the best of our knowledge, there has been no indication that there is a shortage of skilled personnel adequately trained to dispose of the material. The companies and their subcontractors who have been awareded the contracts have spent considerable time and resources training their employees in the proper and safe disposition of toxic materials.

Question 6:

What do you do with the toxic materials you assemble?

Answer

Actions taken by EPA or the States in response to hazardous substance releases could require on-site storage, treatment, containment or disposal of toxic materials.

Actions, taken at the location of the release, will include, as directed in section 101 (24) of the statute, storage, confinement, perimeter protection using dikes, trenches, or ditches, clay cover, neutralization, cleanup or released hazardous substances or contaminated materials, recycling or reuse, diversion, destruction, segregation of reactive wastes, dredging or excavations, repair or replacement of leaking containers, collection of leachate and runoff, on-site treatment or incineration and other measures as appropriate to the circumstances of a particular site.

Off-site treatment, storage or disposal may be required if it is determined that such actions are more cost-effective; or will create new capacity to manage hazardous substances in addition to those located at the affected facility; or are necessary to protect public health or welfare or the environment from a risk created by further exposure to the toxic substances. Off-site treatment, storage or disposal will be in compliance with sub-title C of the Solid Waste Disposal Act.

Question 7:

It is my understanding the funds from Superfund for development of the natural resource damage assessment requlations by Interior have been denied by EPA. Why were funds denied as such responsibilities are eligible for Superfund monies?

Answer:

The development of natural resource damage regulations, which has been delegated to the Secretary of the Interior by the President, is a requirement of Title III of the Superfund statute. The EPA Office of General Counsel, in an opinion dated June 21, 1982, reaffirmed a previous opinion which stated that with the exception of the section 301 (e) study, Trust Fund monies can only be used to support Title I activities. Therefore, the costs incurred in implementing Title III, such as natural resource damage assessment regulations, are not compensable from the Fund.

On the basis of the General Counsel's opinion, the Department of the Interior was denied funding for Title III activities. It should be noted that EPA is not using Trust Fund monies to support the development of the Title III studies for which EPA is responsible.

RESPONSES TO SENATOR RANDOLPH'S QUESTIONS

Q: The post-closure tax does not begin until October 1983. What progress has EPA made on the study required by section 301(a)(2) to establish an appropriate tax rate?

A: The post-closure tax is statutorily set at $2.13 per dry weight ton of waste determined to be hazardous under RCRA as of December 11, 1980. Section 301(a)(2)(i) requires EPA to recommend, by December 1984, an appropriate tax rate for wastes which might be determined as hazardous under RCRA after December 11, 1980. We have not yet begun this study since the listing of wastes under RCRA is a continuing process and the report called for under §301(a)(2) is not due for another two years.

Two additional studies are also of interest: First, under CERCLA §301(a)(2)(ii) EPA is required to assess the adequacy of the Post-Closure Fund. We are currently working on this study and anticipate preliminary results by summer, 1983; a report to Congress is required by December, 1983. Second, CERCLA §301(a)(1) requires the EPA to conduct an assessment of the feasibility and desirability of a degree-of-hazard tax system. Work is just beginning on this study; a report to Congress is required by December 11, 1984.

Q: There is a technical error in §303 (the "sunset" provision) that seems to suggest the post-closure tax would end September 30, 1985, or only two years after it begins. This tax is intended to always be available, to maintain the post-closure fund at $200 million. The Administration would not have any objection to our correcting this error, would it?

A: We are currently reviewing the need for legislative action on the Post Closure Fund. We believe, at this time, it is premature and unnecessary to recommend any legislative changes to CERCLA.

Q: The recently promulgated standards for land disposal, under the hazardous waste regulatory program, require very little for existing landfills. Does not this cause concern that a very heavy burden will be placed on the Post-Closure Trust Fund, after these existing landfills close?

A: The recently promulgated land disposal standards consist of two significant protections: One is a set of design and operating standards separately tailored to each of the four types of land disposal facilities covered by the regulation. The other is a single set of groundwater monitoring and response requirements applicable to each of these facility types. The former is intended to ensure that owners and operators minimize the formation of leachate and the migration of leachate to the adjacent subsurface soils and to groundwater and surface waters. The latter is intended to ensure that facility owners and operators detect any groundwater contamination and perform corrective action when necessary. If these complementary sets of standards are followed, the demands on the Post-Closure Fund should be minimized.

CERCLA requires the EPA to report to Congress by December 11, 1983, on whether the Post-Closure Trust Fund will be adequate for its purposes. In order to prepare this report, EPA will need to predict the likely future performance of RCRA-permitted land disposal facilities and the consequences of releases of hazardous wastes from such facilities. Given the enormous uncertainties involved in making such projections--the numbers of new facilities, the timing of facility closure, and the amounts and types of wastes likely to be land-disposed in the future are but some of these uncertainties--the EPA has undertaken the development of a computer simulation model to assist in assessing the adequacy of the Post-Closure Fund. Phase I of the model development effort will be completed shortly; Phase II will be completed by summer 1983, and we anticipate we will be able to make an early assessment of fund adequacy at that time.

Question

One difficulty with the lack of specific criteria for remedial action in the Plan is the problem States have in knowing what future costs they must assume.

The Plan requires States to pay all the future operating and maintenance costsfor remedial action. The Congress intended, however, that the States bear only 10 percent of the total costs, including operating and maintenance costs, with the Fund bearing the rest. This is so that the Fund is not tempted to select remedial actions with low first-cost, but high maintenance and up-keep.

When the Plan calls for "cost effective" remedial action, what guarantees are there that all costs, including future costs and potential damage to third parties from incomplete clean-up, will be considered?

Answer:

It must be realized that CERCLA section 104(c)(4) imposes the selection of appropriate remedial actions which provide a balance between the need for protection of public health and welfare and the environment at the facility under consideration, and the availability of amounts from the Fund established under title II of CERCLA to respond to other sites which present or may present a threat to public health or welfare or the environment, taking into consideration the need for immediate action.

In analyzing remedial action alternatives, EPA requires an analysis of all costs of each alternative, both capital and operation and maintenance costs. Both costs are considered in the present worth analysis. This analysis, in turn, serves as the basis for the cost portion of the cost-effectiveness analysis. EPA then has the flexibility during this analysis to consider other factors such as reliability implementability, and effectiveness EPA therefore considers all costs, both monetary and non-monetary. In fact, when the State has the lead for a Superfund project, the State can consider the appropriate non-monetary factors and recommend a remedy to the EPA. Even when the EPA has the lead, the State still has an opportunity to review the feasibility study at each stage of preparation. The NCP requires EPA, on the basis of this analysis to select the remedy which minimizes and mitigates and provides adequate protection of public health and welfare and the environment. Furthermore, States will have a greater say in the remedy selected because Agency policy requires States to contribute 10 percent of the costs of remedial planning activities, including remedial investigations and the feasiblity studies.

Please note the requirement that States pay all future operating and maintenance costs is part of policy guidance that was issued by the Agency. The NCP contains a provision that is taken from the statute. The operations and maintenance guidance was issued in a separate document.

Question 3

One thing we have already learned is that the $1.6 billion authorized for the Fund will not be enough to cleanup the sites and spills for which it is needed. Does the Administration still intend to request and obligate the entire $1.6 billion before the end of the authorization period? Is it not apparent, now, that additional funding will be necessary to complete the task?

Answer

The Environmental Protection Agency (EPA) has long recognized that $1.6 billion may not be enough to clean all the existing hazardous waste sites or to respond to every spill of hazardous substances onto land or into the air or non-navigable waters. Moreover, it was never the intention of Congress that the Federal Government obligate money from the Trust Fund to remedy every hazardous waste problem. The Agency intends to use the Trust Fund to respond to those sites at which responsible parties are unavailable, unable or unwilling to correct the situation. The Agency also intends to use all authorities provided to it by CERCLA, including the enforcement-related authorities, to pursue voluntary and court mandated remedies at uncontrolled hazardous waste sites. Through this comprehensive approach, EPA feels that it will be able to achieve appropriate remedies at a signficiant number of sites. However, at this point in time, it is not possible to determine what, if any, additional funds will be desirable for this program.

Question 4

> Section 102 of the Superfund law requires the Administrator to publish "reportable quantities" of hazardous substances. What progress is being made on establishing such reportable quantities?

Answer

Section 102(b) of the law requires any hazardous substance, as defined in section 101(14), to have a reportable quantity of one pound or the reportable quantities established pursuant to section 311(b)(4) of the Federal Water Pollution Control Act unless and until superseded by regulations establishing reportable quantities under section 102(a).

The Agency has completed the technical analyses necessary for establishing reportable quantities for the majority of the hazardous substances referred to in section 101(14).

A Notice of Proposed Rulemaking is being prepared for these 101(14) substances. The Notice is currently undergoing internal Agency review and is expected to be signed by the Administrator and published in the Federal Register in early fall.

Question 5:

On June 8, 1982, a truck carrying toxic herbicides crashed, spilling large quantities of the material on a home near McCreery, West Virginia. Besides contaminating the home and yard, toxic material apparently entered nearby waterways. At last report, newspaper accounts that the affected family had serious health complaints have not been followed up with health assessments or treatment. The site seems not to have been completely decontaminated.

Question

Did the National Response Center (NRC) receive notice of the spill?

Answer

The NRC received notice of this spill on June 8, 1982, at 1947 hours (7:47 p.m.) from the State of West Virginia Emergency Services (Mr. Morris).

Question

Was any response or evaluation under the Superfund Law undertaken?

Answer

The EPA Wheeling, WV, office immediately upon being notified of the incident on June 9, 1982, at 1000 hours (10:00 a.m.) stayed in close contact with the West Virginia Department of Natural Resources and other State personnel who where already on-scene. EPA Wheeling was assured by the State that the situation was under control and adequate cleanup measures were being carried out by the responsible party, Railroad Weed control (subsidiary of Chem Lawn). State lab personnel conducted sampling and analysis and reported to EPA Wheeling that no significant levels of toxicity were found, only trace levels. As a precaution, the State did alert water plants downstream immediately after the incident.

When the EPA On-Scene Coordinator (OSC) was able to inspect the site of the accident (the Wheeling office was down to one man when the incident occurred), he made a request of the responsible party that a more thorough cleanup, involving soil removal, be accomplished and the company complied.

Question

If adequate health evaluations of the affected family have not been performed, or if adequate removal action has not been taken, will the EPA act under Superfund Law?

Answer

The State of West Virginia Department of Health conducted health screening of all affected persons and it is EPA's understanding that the State continues to monitor them. In the opinion of the OSC, adequate removal actions have been taken by the responsible party. EPA Wheeling office considers the incident closed, pending results done following the last removal action.

SENATOR D'AMATO'S QUESTIONS

1. On June 14, 1982, EPA informed the Senate Environment Committee that the Love Canal Report would be released by July 14, 1982. On June 15, 1982, the day after EPA informed the Senate when the report would be released, HHS determined that "with the data available to it, no definite recommendations or conclusions as to the habitability or the potential human health risks of the Love Canal area can be made." What was the reaction in EPA to this change of position by HHS? What steps did EPA take to reverse the HHS decision of June 15, 1982? Did EPA bring pressure upon HHS to reverse its decision once again, as it finally did on July 13, 1982?

2. The Love Canal monitoring report had originally been scheduled for release in December 1980. Please review the decision-making process within EPA surrounding the release of the report. Discuss the interaction with the Department of Health and Human Services and the National Bureau of Standards.

3. Can the 19-month delay in the release of the report be attributed solely to the involvement of HHS and NBS? During the course of the 19-month delay, why did EPA make no attempt to communicate with Congress as to the progress it was making with the report? Did EPA reach tentative conclusions during that period which changed with the final release of the report?

Q. 1. Pressure on HHS

A. 1. The decision of HHS to modify its tentative conclusions on habitability, was somewhat of a surprise; however, it was understandable, particularly in light of some of the NBS comments, which, while valid, were confusing. It became apparent in subsequent phone conversations with HHS, that their concerns were a result of deficiencies in presenting and explaining EPA data and procedures, and not in the data base itself or the analytical procedures used. Therefore, we resolved to stick to our July 14 release schedule, but to do our best in the time remaining to clarify and address the issues raised by NBS.

Accordingly, we prepared a detailed response to NBS and sought meetings between NBS, HHS, Dept. of Justice, and EPA to discuss these matters. During our first meeting, at which HHS representatives were unable to attend, the NBS representatives made clear that, despite the questions they had raised, they regarded the EPA study as both "reasonable and acceptable".

One of the main technical issues was that, because of the extremely low concentrations of chemicals present in the vast majority of the samples taken, EPA was acting at the frontiers of analytical capability and using "state of the art" techniques. In such situations, it is often the case that not enough prior experience exists to define with confidence the "method detection limit," or MDL, for the techniques used. However, we were able to demonstrate that the MDLs we could define with confidence for 38 chemicals could be used for the other 95 chemicals of interest because of the similarity of chemical families.

Following a number of discussions with both NBS and HHS, EPA sent a letter dated June 29 to Dr. Clark Heath, Director of the Chronic Diseases Division, Center for Disease Control, outlining EPA's position on the MDL issue. We also arranged to meet with both NBS and HHS on July 8 in the expectation of being able to resolve the remaining issues.

During the course of this meeting, it became clear that, while the questions raised by NBS related to potential errors in our measurements in the parts per billion or the parts per trillion range, HHS was primarily concerned with making sure we did not miss any contaminants at much higher levels and that we were not reporting "false negatives."

At the request of HHS, Dr. Raymond Kammer, Deputy Director of NBS, wrote a follow-up letter after this meeting. Dated July 9, the letter states that the methods used by EPA are generally acceptable and represent the state of the art. In addition, Dr. Kammer wrote that EPA's quality assurance program should have been adequate to maintain quality control.

Based on the meeting and on Dr. Kammer's letter, Dr. Brandt was able to send John Hernandez a letter and statement dated July 13

reaffirming HHS's former position on habitability. Dr. Heath agreed to appear with EPA at our July 14 release of the report and to state publicly the HHS position. This re-affirmation by HHS did not result from "pressure" exerted by EPA, but from the fact we were able to answer the NBS questions to the satisfaction of the professionals at HHS.

Q. 2. Decision making process

A. 2. The decision making process followed by EPA in preparing and releasing its report was guided by the following principles:

° The conclusions and recommendations contained in the report should be only those clearly supported by a verified scientific data base;

° The government should, to the extent possible based on the data, make a determination of present and future habitability;

° The report should be released in as timely a fashion as possible and should be written in a way that was understandable and useful to the residents and officials of Niagara Falls.

To support the first of these principles, the data base and and scientific methods used were peer reviewed by EPA's Science Advisory Board and partially by the National Bureau of Standards. The report was also thoroughly reviewed internally. During this process the report went through several draft and revision stages.

To make the habitability determination EPA sought the participation of the Department of Health and Human Services. HHS submitted a report to EPA in November of 1981 summarizing its findings.

The NBS review was extensive and more complex than originally anticipated. It was based on written documentation provided by EPA over the period June 1981 through February 1982. NBS submitted its final review comments on May 10, 1982. As a result of NBS - EPA interactions, portions of the final EPA report were rewritten in light of suggestions and questions that appear in the NBS report, but that were communicated orally to EPA during the review period.

In early May, Dr. Hernandez, EPA Deputy Administrator, appointed Dr. Richard T. Dewling, Deputy Regional Administrator in Region 2, to coordinate and manage the process of final publication of the EPA documents and the HHS and NBS statements.

On June 15, EPA was advised by Dr. Edward Brandt of HHS that his Agency was withdrawing its habitability determination because of the questions raised by NBS. EPA resolved at this point to continue to address the issues raised by NBS and to attempt to clarify matters to the satisfaction of HHS. EPA also resolved to stick to the July 14 deadline suggested by the Senate Environment Committee regardless of whether the NBS-HHS issues were resolved by that time. Had the issues not been resolved, EPA intended to issue its report accompanied only by its own conclusions and recommendations, in hopes the HHS recommendations could follow at a later date.

As it developed, the issues were resolved, as discussed under Question 1.

J. Deegan, Jr.
9/3/82

D'Amato question 3.

The 19-month "delay" in release of the EPA Love Canal report can be attributed to numerous factors. Among those factors responsible for the length of time that it took EPA to complete the Love Canal report are the following:

1. The initial release date of January, 1981 that was promised in May, 1980 was established before the initiation of sampling at Love Canal, without benefit of knowing the magnitude of the monitoring effort to be conducted, and with no knowledge of the length of time required to complete the entire study.
2. Because more than 6,000 samples were collected at Love Canal the analyses of those samples was not completed until May, 1981. The statistical analysis of the data was not completed until late August, 1981.
3. An evaluation of the health implications of the monitoring data by the U. S. Department of Health and Human Services proceeded in an orderly fashion, after the EPA data were available, and was tranmitted to EPA in November, 1981.
4. An evaluation of the analytical chemistry methods and results by the National Bureau of Standards took considerably longer than planned. The evaluation, which was initiated in August of 1981, was not completed until May, 1982. The complexity and magnitude of the EPA Love Canal study was mainly responsible for the length of time required to complete the thorough study performed by NBS.

Progress on the EPA Love Canal report was regularly described to the media and appeared in numerous newspaper articles. In addition, the periodic inquiries on Love Canal received from members of Congress were responded to promptly.

The only change that occurred to the EPA report prior to its public release, involved removal of an EPA recommendation on habitability that appeared in draft versions of the final report which were prepared prior to June, 1982. The reason for removal of this recommendation was that it was EPA's judgement that such a recommendation ultimately involved health considerations, in addition to environmental conditions, and that a recommendation on habitability should therefore be made by the federal government. A recommendation on habitability was provided by the Department of Health and Human Services.

SENATOR MOYNIHAN'S QUESTIONS

Question 1. In a memo dated May 28, 1981, Dr. Leonard Greenfield, Chairman of EPA's Sampling Protocols Study Group, wrote to you expressing the concern that the agency's draft report did not "reflect contemporary scientific thought on the subject of the distribution and fate of toxic chemicals in the environment." Greenfield went on to say that, "Because of the necessary constraints placed on the analytical contractors [in the Love Canal monitoring study], it appears that a significant number of compounds of toxicological interest and enforcement potential were not reported." I have a copy of a reply to Dr. Greenfield's memo from John Hernandez, Jr., Deputy Administrator of EPA, but it is dated October 6, 1981. Why did it take over four months to respond? How did the agency address Dr. Greenfield's specific concerns?

Answer. During the interval May 28, 1981 to October 6, 1981 EPA was involved in an evaluation of the merits of the concerns expressed by Dr. Leonard Greenfield and other members of the EPA Sampling Protocols Study Group of the Science Advisory Board. This evaluation involved the following major events. First, an intensive audit of the computer files created during the gas chromatography/mass spectrometry (GC/MS) analyses performed on Love Canal samples was designed, conducted, and a report written. This investigation revealed that the Love Canal analytical subcontractors performed satisfactorily, and that there was no omission in their data reports of a significant number of compounds of toxicological interest and enforcement potential. Second, an investigation had to be performed by the Office of General Counsel on one of the consultants to the EPA Sampling Protocols Study Group (Dr. John Laseter), for reasons of potential conflict of interest activities stemming from his prior employment relationship with Hooker Chemical and Plastics Corporation. This investigation ultimately cleared Dr. Laseter of any wrongdoing. Third, and agreement had to be developed between EPA and the National Bureau of Standards to perform a thorough review of the entire analytical chemistry portion of the EPA Love Canal study. This review was initiated in August, 1981 and was not completed until May, 1982. And fourth, the EPA draft final report had to be re-written completely, after extensive statistical analyses of the data, in order to ensure that the report reflected contemporary scientific thought on the subject of the distribution and fate of toxic chemicals in the environment. The resulting draft final report, which addressed all of Dr. Greenfield's concerns, was not completed until late September, 1981.

Question 2. I must again ask you about the date, May 1982, printed on the cover of each volume of the Love Canal monitoring study released on July 14, 1982. On July 14th you assured me that the report was in fact up to date, reflecting information current through July. Could you first tell me how the report changed between May and July? My next question is, why was the report delayed? Did the delay relate to the comments EPA received from the National Bureau of Standards on May 10th?

Answer. The May date printed on the final versions of the report reflects only the logistical problems associated with producing such a complex document. Volumes II and III, which contain only the data, were printed before May. Volume I, which contains EPA's interpretation of the data, was not actually printed until late June. Since Volumes II and III made reference to Volume I, and Volume I made reference to the "Interagency Review Document", it was appropiate for reasons of continuity and clarity to have all Volumes with the same date on the cover. The May date is the release date that was anticipated at the time the covers were printed. The delay from May to July resulted primarily from continuing internal review, but this was also the period during which most of the effort to address the NBS and HHS concerns took place.

Question 3. Could you explain how you were able to assure HSA on July 8 that the trace and no-detect values reported in your sampling data would in no case, even taking into account measurement errors, exceed values in the part-per-billion range (that is not at levels in the part-per-million range)? Was this transmitted in writing? If so, can you provide a copy?

Answer. EPA's scientists reviewed all their data based on the NBS questions. They pointed out that, as part of the Love Canal study, method detection limits (MDLs) and precision and accuracy estimates were derived for 38 organic chemicals and 16 inorganic chemicals out of the approximately 150 compounds that were measured. The EPA scientists stated that in their professional judgment, it was reasonable to assume that the MDLs and precision and accuracy of the approximately 95 other organic chemicals were similar to the 38 for which EPA did have values.

This was transmitted via a letter dated June 29 from Dr. Richard T. Dewling, Deputy Regional Administrator, EPA Region 2, to Dr. Clark W. Heath, Director, Chronic Diseases Division, Center for Disease Control, HHS. The issue was also discussed orally on July 8. A detailed suporting document was provided to CDC on July 9 in the form of a memo to Dr. Dewling from William L. Budde, Chief of EPA's Advanced Instrumentation Section, Physical and Chemical Methods Branch and Robert L. Booth, Acting Director of EPA's Environmental Monitoring and Support Laboratory, both in Cincinnati. These documents are both contained in the volume entitled "Environmental Monitoring at Love Canal—Interagency Review," a copy of which was provided to the Committee.

Question 4. In his testimony Dr. Brandt states that, "it is imperative that the remedial work already done on and around the canal be permanently monitored and maintained." Does EPA have plans to undertake such monitoring? If not, who will be responsible for the ongoing monitoring? Does EPA have an opinion as to what form the monitoring should take?

Answer. A long-term monitoring program is planned for the Love Canal Area. The monitoring will be accomplished by the State of New York through the cooperative agreement to which $1,610,000 has been obligated for this purpose. Since the monitoring program is contingent on the method and details of construction of the remedial action, the monitoring program is just being developed by joint efforts of the State and EPA.

Department of Justice

STATEMENT

OF

CAROL E. DINKINS
ASSISTANT ATTORNEY GENERAL
LAND AND NATURAL RESOURCES DIVISION

BEFORE

THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

CONCERNING

IMPLEMENTATION OF THE COMPREHENSIVE ENVIRONMENTAL
RESPONSE, COMPENSATION AND LIABILITY ACT OF 1980

ON

AUGUST 4, 1982

I appreciate the opportunity to appear before the Subcommittee to discuss the role of the Department of Justice in the implementation of the Comprehensive Environmental Response, Compensation and Liability Act of 1980. Last July when I testified before this Subcommittee, I stressed that an essential element in the successful implementation of Superfund, and the other statutes governing the handling and disposal of hazardous wastes, was a vigorous, effective enforcement program. As the Subcommittee is doubtlessly aware, the use of administrative and judicial enforcement has been necessary to insure that the important goal of voluntary compliance with environmental laws is realized. Unless regulated entities understand that the government will undertake prompt action to require cleanup of hazardous waste sites and recover the cleanup costs, voluntary compliance is likely to diminish.

The Land and Natural Resources Division places a very high priority on the enforcement of environmental laws in general and the Superfund statute in particular. I would like to take a few minutes to discuss the efforts which the Department has made in this important area during the past year. During the course of my testimony, I will address the specific topics mentioned in the Chairman's letter of July 22, 1982.

The Department's primary role in the implementation of Superfund is to represent the interests of our client agency, the EPA, and the United States in litigation. This, of course, has both enforcement and defensive litigation aspects. The responsibility for the identification of hazardous waste sites which require attention under Superfund and the policies to implement the statute including those relating to the expenditure of funds and the timing of those expenditures has been delegated by the President and the Congress to the EPA. EPA has in turn delegated to its Offices of Solid Waste and Emergency Response and Legal and Enforcement Counsel responsibility for such matters as the identification of potentially responsible parties at sites, the nature and extent of the hazard to be addressed at the site, and contact with responsible parties to attempt to secure voluntary action at sites. Similarly, the decision to undertake formal enforcement action at sites by administrative order or referral of matters to the Justice Department for the initiation of litigation to require cleanup under §106 or recoup costs under §107 of Superfund is within EPA's area of responsibility.

Currently, the agency's Offices of Solid Waste and Emergency Response and Legal and Enforcement Counsel identify and notify potentially responsible parties of EPA's desire to discuss alternatives for cleanup of hazardous waste sites. Subsequent decisions on the level of enforcement activity are also the responsibility of those offices within EPA.

We have continued our efforts to insure close cooperation between EPA and the Department on enforcement matters. In April of this year, Robert Perry, Associate Administrator for Legal and Enforcement Counsel, myself and our top management staff met at the FBI Academy at Quantico, Virginia, to discuss ways of improving the management, handling and coordination of our enforcement effort. We memorialized our mutually agreed upon approach to enforcement matters in a document which has become known as the Quantico Guidelines. The essence of the guidelines is that the prompt, aggressive handling of enforcement actions, combined with close cooperation of our respective staffs, is essential to an effective enforcement program. We have continued our regular consultation between staff attorneys and technical personnel to identify cases in which the Department should become involved at an early stage to assist the agency in case development and preparation. This also insures that matters which require policy input are identified and disposed of quickly to allow the enforcement process to operate smoothly. I would like to emphasize that I am firmly committed to the process of early involvement in case development and will continue to make available the staff of the Environmental Enforcement Section to help EPA whenever our assistance is requested. Given the resource intensity of these types of cases, this process of coordination and cooperation is absolutely essential to the development of a successful litigation strategy.

In the last year, the Department has devoted a substantial portion of its environmental enforcement resources to the hazardous waste and Superfund enforcement effort. Last July, I merged the existing Hazardous Waste and Environmental Enforcement Sections to allow us to respond more efficiently and effectively to EPA's enforcement initiatives. Combining the two sections has allowed us to direct necessary resources to cases which demand several attorneys in a way which was not previously possible. Moreover, by simplifying the management structure within the Division and focusing liaison with EPA in a single unit, we have improved communications with our client.

The Subcommittee will recall that the Division was devoting approximately 15 attorneys to hazardous waste litigation prior to July 1, 1981. This number included both enforcement and defensive litigation. The Division now has more than 30 attorneys handling this type of litigation. Moreover, the number of paralegals employed in support of this litigation has doubled.

We have already added 5 attorneys and 2 support staff to handle our existing and anticipated case load under Superfund. By the end of this fiscal year, we expect to add an additional 8 to 10 attorneys and additional support staff. We will continue to add staff as case load requirements dictate. Thus, by the end of FY '82, the combined strength of the Environmental Enforcement Section will be approximately 36 attorneys and 31 support staff compared with approximately 23 attorneys and 25 support personnel at this time last year.

The Department does not plan to keep the level of these sources static. Superfund has authorized the Department to spend $2 million to pay for the litigation effort under Superfund and we have authorization to add up to 42 full-time employees as case load levels require the hiring of additional personnel. Thus far, we have spent more than $627,000 during FY 1982 and expect to spend over $1,000,000 by the end of the fiscal year.

Much of the enforcement effort during this past year has been devoted to the completion of cases on our existing docket and coordination with EPA in the development of new Superfund cases. As of May 1982, the Environmental Enforcement Section had devoted more than 9,000 hours to the existing case docket of §7003 and Superfund cases. We have finalized 15 settlements during this period which will provide more than $55 million in cleanup expenditures at hazardous waste sites. We have added Superfund counts in 15 cases under §106 and 6 cases under §107. The only cases in which Superfund counts have not been added after a referral by EPA are those in which negotiations are proceeding towards an acceptable conclusion, cases in which the litigation strategy makes addition of a Superfund count inadvisable at present, or cases in which the case development has not progressed to the point where an action can be filed.

Most Superfund cases on our docket are actions for injunctive relief under section 106. Cost recovery actions under section 107 represent a relatively smaller portion of our existing docket at present. This is not surprising, however, since most cost recovery actions will not ripen sufficiently to justify filing suit until a discrete phase of Superfund activity resulting in fund expenditures has been completed. We expect such referrals to increase substantially during the next three fiscal years.

I might add that we are not only seeking recoupment of direct costs of cleanup but are pursuing the recovery of litigation costs incurred in these cases.

We are not unmindful of the important role which State and local governments must play in this area. We continue to provide assistance to State enforcement programs whenever possible. In October of 1981, the Department conducted a hazardous waste training program for State Attorneys General and federal attorneys. The response was enthusiastic and positive. More than 100 attorneys attended the 3-day program. We provided written materials to each participant which contained more than 1,000 pages discussing the legal theories and technical basis underlying enforcement in the hazardous waste area.

Finally, I would like to advise the Subcommittee that the study mandated by section 301(e) has been recently completed and a limited number of copies are being printed at by Department of Justice. This should be delivered to Congress in late August or early September. We have informed the staff of this Subcommittee that in order to make the study available to the public, the Congress may have to order a mass printing to supplement our limited printing.

I appreciate the opportunity to address the Subcommittee and would be glad to respond to any questions you may have.

STATEMENT OF BRUCE BLANCHARD, DIRECTOR OF THE OFFICE OF ENVIRONMENTAL PROJECT REVIEW, U.S. DEPARTMENT OF THE INTERIOR, BEFORE THE SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION, SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, AUGUST 4, 1982

Mr. Chairman, I am Bruce Blanchard, Director of the Office of Environmental Project Review for the Department of the Interior. We would like to thank you for the opportunity to testify before the subcommittee on this important subject.

My office is responsible for oversight of Departmental compliance with the National Environmental Policy Act and the various Federal pollution control statutes for air, water, solid waste, noise, radiation, pesticides, and toxic and hazardous substances. Recently I have been assigned similar responsibilities for Interior's participation in the National Contingency Plan (NCP) including response management and damage assessment activities.

National Contingency Plan

Interior has been involved with the NCP since its inception. In 1968 we initiated the first plan which was an interagency agreement known as the National Multi-Agency Oil and Hazardous Materials Pollution Control Plan. In 1970, Section 11 of the Federal Water Pollution Control Act was enacted and Executive Order 11548 assigned lead responsibility for the plan to the Council on Environmental Quality. With the subsequent creation of the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA), certain responsibilities were transferred to EPA and the plan was published in the Federal Register in 1971. The 1972 amendments enacting Section 311 led to Executive Order 11735 and resulted in the codification of the plan in 1973 (40 CFR 1510). The plan has had a variety of technical amendments over the years, but it has stood the test of time and still bears a remarkable resemblence to the original interagency agreement. It has proven to be one of the most effective examples of interagency cooperation ever produced by the Federal Government.

Interior has been a major participant on the National and Regional Response Teams (NRT/RRT) throughout this period. In this regard we currently have interagency agreements with the U.S. Coast Guard dealing with pollution discharges from Outer Continental Shelf operations as well as Fish and Wildlife Service pollution response activities. Of the approximately 10,000 oil and hazardous substance discharges each year, we respond to about 500. Many times we are the first Federal agency on site and assume the role of the On-Scene Coordinator (OSC) until either the EPA or the U.S. Coast Guard arrives. We are proud of our excellent working relations with participating Federal agencies as well as the States.

Pursuant to the provisions of Section 105 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Executive Order 12316, the NCP was revised and published in the Federal Register on July 16, 1982. We have participated in the preparation and review of this revised plan and it has our support. We look forward to its implementation following Congressional review.

Natural Resources Trustees

The Department traditionally enforced its various statutory and common law authorities in response to oil and hazardous substances spills which affected resources we were charged to protect.

In the early 1970's, liability acts for oil and hazardous substance discharges began to acknowledge liabilities for damages to natural resources. These included the Federal Water Pollution Control Act, the Trans-Alaska Pipeline Authorization Act, and the Deepwater Ports Act. The Clean Water Act of 1977, the Outer Continental Shelf Act Amendments of 1978, the Clean Water Act Amendments of 1980, and CERCLA have each built on this and firmly established the role of Federal and State governments as trustees for natural resources.

The CERCLA provides that the trustees are responsible for assessing damages, seeking recovery, and preparing and carrying out restoration, rehabilitation and replacement plans for natural resources. It defines natural resources to include land, fish, wildlife, biota, air, and water, including ground water and drinking water supplies, and identifies States as trustees for such natural resources within the boundary of, belonging to, managed by, controlled by, or appertaining to a State. On the other hand the Federal trustee is limited by the Act to those natural resources over which the United States has sovereign rights or which are managed or protected by the United States.

The revised NCP, in Subpart G, acknowledges the wider role of State trustees and properly limits the roles of Federal trustees. It also designates appropriate Federal agencies as trustees and provides for cooperative or joint efforts where there is more than one trustee agency due to concurrent or contiguous jurisdictions.

Damage Assessment Regulations

Section 301(c) of CERCLA provides for regulations to be used by trustees in assessing damages to natural resources. Responsibility for preparing these regulations has been assigned to the Department of the Interior by E.O. 12316. We had anticipated that this effort would be funded by the Superfund, but the Act has been interpreted to prohibit funding this task. As a result, the Department is now forming a team to develop these regulations from existing financial resources. I will be heading that team. This will be a difficult task, and at this point, we are uncertain as to how long it will take. We will, however, push as rapidly as we can.

Thank you for the opportunity to appear before you. I will be happy to respond to any questions which you may have.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Office of the Assistant Secretary
for Health
Washington DC 20201

STATEMENT

BY

EDWARD N. BRANDT, JR., M.D., Ph.D.

ASSISTANT SECRETARY FOR HEALTH

DEPARTMENT OF HEALTH AND HUMAN SERVICES

BEFORE THE

SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION

SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

AUGUST 4, 1982

Mr. Chairman and Members of the Subcommittee:

I am pleased to have this opportunity to discuss the Department of Health and Human Services' (HHS) implementation of health activities under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, or as it is more often called, the Superfund Program. I have with me today Dr. William H. Foege, Director of the Centers for Disease Control (CDC); Dr. Vernon Houk, Acting Director of CDC's Center for Environmental Health; and Dr. David Rall, Director of the National Institute of Environmental Health Sciences (NIEHS) of the National Institutes of Health (NIH).

As you know, this Department has a long history of involvement in the study of toxic substances and their effect on human health. The Public Health Service (PHS), through the Centers for Disease Control has responded to numerous environmental emergencies in recent years such as the eruption of Mt. St. Helen's and the Three Mile Island incident. CDC's National Institute for Occupational Safety and Health (NIOSH), operating under the authority of the Occupational Safety and Health Act of 1970, has also evaluated potential health and safety hazards to workers at several hazardous waste sites in the last several years, including the fire at Elizabeth, New Jersey, in 1980. CDC has also conducted long-term complex epidemiologic investigations of persons exposed to hazardous substances, including the pentachlorophenol (PCP) study of log houses and the current chromosome studies at Love Canal.

Through the National Institutes of Health's leadership, we support a broad range of research which has greatly expanded our awareness of potentially toxic substances and our understanding of the human health effects which may result from exposure to them. For example, at NIEHS a major study is underway which is measuring levels of polychlorinated biphenyls (PCBs) and other compounds in mothers giving birth and in their breast milk over time, and also collecting clinical data on growth, morbidity and development in their children. This study is expected to result in further development of methodology for screening human populations for chemical exposure. Through other research supported by NIEHS, a practical means for detoxifying persons exposed to the pesticide kepone was found. The National Cancer Institute (NCI) has made major advances in cancer epidemiology which have substantially furthered our knowledge of the effects of chemical exposure in humans. The National Toxicology Program (NTP), which provides coordinated management of HHS toxicological testing and test development, tests selected chemicals for toxicity while also developing new and better testing systems. Further, through the Food and Drug Administration (FDA) we investigate and control contamination of the nation's food supply from toxic substances.

In order to bring all of this expertise to bear on implementing the health related provisions of Superfund, last summer I designated the Centers for Disease Control as the lead agency to coordinate the implementation of Superfund activities among all relevant components of the Public Health Service. This interagency approach has been very successful. During the past year more than 100 health professionals from CDC, NIEHS, NIH, and FDA have been involved in Superfund activities. Therefore I continue to support legislation introduced last year to delete the requirement for creation of a new Public Health Service agency for Superfund.

During the past year, CDC has actively pursued negotiations with the Environmental Protection Agency (EPA) and worked with the other agencies of the Public Health Service to develop and implement a full-scale program of health activities under Superfund. Your letter of invitation details five such health activities that are mandated under the law. I would like to take a few minutes now to address these activities directly, and then go into more detail in my discussion of our Interagency Agreement with EPA.

The first area you mentioned calls upon HHS to establish disease/exposure registries. As you know, the establishment of such registries is an expensive proposition, and one that often takes 20-25 years of follow-up to yield results. We are currently carefully examining the known health effects of chemicals found in abandoned hazardous waste sites to determine the most cost-effective registry mechanism that will demonstrate whether or not a health hazard exists. To provide full review and guidance on the issue of registries, last year we established a Subcommittee on the Use of Long-Term Registries for Health Follow-up of Populations Exposed to Toxic Hazards. That Subcommittee's report has been endorsed by the Public Health Service and is being reviewed for guidance in establishing registries under Superfund. Under other authorities we have already established a major registry on polybrominated biphenyl (PBB) exposure in Michigan in cooperation with the State, and NIOSH has set up a number of registries dealing with worker exposure to such toxic substances as kepone, dibromochloropropane (DBCP) and dioxin. NIOSH has also established a disease registry for berylliosis.

A second HHS activity mandated under the law is conducting health surveys and studies. As I will describe in more detail shortly, we are currently conducting or have finished such surveys and studies at five Superfund sites. We are also in the process of developing health study proposals at other sites.

The Superfund law further requires us to develop and provide testing for exposed individuals. CDC's laboratory in the Center for Environmental Health is planning to apply new testing methodologies to pinpoint more accurately the health effects of exposure to toxic substances. Through two-dimensional electrophoresis, immuno screening for environmental toxins, and other new technologies, we hope to predict more accurately health risks from such exposure. For the last several years NIEHS has been conducting research to develop methods for recognizing genetic abnormality in sperm. This is an approach that may have utility for identifying mutagenic damage in human populations chemically exposed. The National Toxicology Program is also supporting research to refine and standardize methods for determining the frequency of chromosome damage. These validated methods will be used to estimate the incidence of damage in selected human populations along with the variables that may influence this frequency.

In March of this year NIEHS issued a Program Announcement expressing interest in supporting research on the development of diagnostic techniques for use in populations exposed to hazardous chemicals, particularly from waste dumps. The need is for laboratory or clinical tests which will assist in detection and measurement of human toxicity from low level chemical exposure. In addition we have begun some testing at Superfund sites, and plan to do much more in the coming months.

The fourth area mentioned in your letter is HHS' responsibility to maintain and provide information on health effects of toxic substances. As I will more fully explain later, the National Library of Medicine has assumed the prime responsibility for creating data records for chemicals from existing information. Based on this effort a newly created Department sub-committee (which I will discuss later) will recommend chemicals for which there is inadequate data, to NTP for testing. NTP is to conduct this testing on a reimbursable basis with EPA. I think it is important to note that of the combined list of approximately 150 chemicals so far identified in Love Canal and other dumps among Superfund priority sites, NTP has tested, is currently testing, or is scheduled to test, in one or more systems, roughly 65 percent of them.

Finally, we are charged with the responsibility of keeping a list of areas closed or restricted because of toxic substance contamination. We have received preliminary information from EPA headquarters which has provided the basis for an initial listing of such restricted sites. We are also working with EPA regional offices, State and local health departments, and other local officials to expand that list, and more fully detail the type of limited access -- for example, security fencing, prohibited swimming or fishing, or no trespassing signs.

The major document which outlines the general scope of our health activities -- and provides the funding mechanism for their implementation -- is the Interagency Agreement between HHS and EPA signed in March of this year. That agreement outlines six specific areas of activity and provides a funding level of $3.34 million for this fiscal year. This funding level was increased to $5 million by the recently enacted urgent supplemental appropriation (PL 97-216), with an additional $2 million which may be available for health studies at the discretion of EPA's Administrator. In the five months since the signing of this agreement we have made significant progress in all six areas, which I would like to describe for you today.

The first area of activity, scientific support, provides for consultation to EPA by HHS physicians, epidemiologists, toxicologists, and other health professionals for assessing the potential health hazards to individuals living or working near toxic waste sites eligible for clean-up under Superfund. This assessment process has included review of environmental test results for indication of human health hazard, data gathering and assessment of health complaints, consultation with local physicians in both the public and private sectors, and assisting State and local health departments in their efforts to assess the potential health hazards of toxic waste sites. Since signing the Interagency Agreement in March, we have responded to 59 requests for assistance, 46 of which were such consultations. Examples of our assistance to EPA include the following:

- EPA initiated an immediate removal action of the MIDCO-I site in Gary, Indiana, to remove some 20,000 drums in varying stages of deterioration as well as a layer of contaminated surface soil and some 210,000 gallons of liquid and solid waste. We assisted EPA in this operation by investigating health complaints from workers at a State garage adjacent to the site, and from one family living nearby. CDC staff analyzed available data and met with the garage workers to report on their findings and alleviate the workers' concerns. We are also currently working in cooperation with the State and local health officials to review health records and other data to determine if any significant exposure might have occurred to the general population from chemicals found at this site.

- At the request of EPA Region VIII, CDC has reviewed an extensive Proposed Study Plan for Hydrogeologic Investigation of the Whitewood Creek Trailings Deposit Site in South Dakota. We made recommendations regarding needed environmental sampling and livestock monitoring to enable us to address health concerns for inclusion in EPA's negotiations with the State and the mining industry involved.

- CDC was also called in by EPA to assess potential health concerns at a hazardous waste site in Cecil County, Maryland. We provided on-scene consultation and recommendations for environmental sampling to determine possible human exposure. We are currently awaiting the results of this sampling, which will be reviewed and appropriate follow-up action taken.

We expect an increased workload and closer coordination of Superfund health assessment activities with EPA in the coming months as we place eight senior public health advisors in the EPA Regional Offices. These HHS/CDC Superfund Regional assignees will be responsible for facilitating health review of potential Superfund sites at an early stage so we can assist EPA in determining the nature and severity of any health hazards. They will also be instrumental in assessing the kind of health expertise needed on site and obtaining that help from the Centers for Disease Control, the Food and Drug Administration or the National Institutes of Health as appropriate.

The second area of health activity outlined in the Interagency Agreement is emergency response -- provision of health related guidance and laboratory support in emergency situations where there is potential exposure to humans following release of a hazardous substance. The following examples demonstrate the kinds of assistance we have provided in nine emergency situations in the past five months:

- Following a train derailment and subsequent fire in Ludowici, Georgia, this past March, EPA personnel discovered that 1,050 pounds of phenyl mercuric acetate were spilled and vaporized in the fire possibly exposing nearby residents, bystanders and a variety of workers engaged in firefighting, wreckage removal, security and emergency response. EPA called on CDC to provide health assistance, to determine what, if any, exposure had occurred. Within six hours a CDC physician and public health advisor were on scene, and by the following evening had collected completed medical history questionnaires and urine samples from the approximately 180 people involved in the incident. The samples were then analyzed by the CDC toxicology laboratory over the weekend. Fortunately, no elevated levels of mercury were found related to the incident.

- In June of this year, EPA requested our assistance following an explosion at the Plastifax Company in Gulfport, Mississippi, which resulted in the death of three workers and injury to the other 11 workers on the premises at the time of the explosion. The health hazard evalution and epidemiologic investigation conducted by CDC personnel concentrated on: (1) identifying the chemicals to which people were exposed in order to advise on potential health risks, and (2) reviewing the health measures being taken for the protection of the clean-up crew and other emergency response workers.

- Another example of assistance provided involved a barge accident in the Mississippi River near Alton, Illinois, and the release of benzene into the river. By phone, we provided the Coast Guard's on-scene coordinator with advice on needed protective gear to protect workers, and when evacuation measures of nearby community residents might be necessary. District FDA investigative workers and lab support personnel were on standby alert during the entire clean-up operation in the event that the release of benzene into the river became substantial.

The third area of our Interagency Agreement with EPA provides support for health studies and assessments undertaken by the Department at five specific Superfund sites prior to the signing of the agreement:

- The North Hollywood Dump Site in Memphis, Tennessee, has been of concern to us since 1980 when high concentrations of several pesticides were documented in soil samples from the dump. Since then we have worked with EPA, the Tennessee State Health Department, and community representatives to develop an appropriate health study to asess human exposure to the major chemicals found in the dump. We expect to have a finished health study proposal submitted to EPA for funding later this month.

- In Old Forge, Pennsylvania a CDC team of physicians joined State officials to test for PCB exposure. In addition to working with the State on this exposure study, CDC personnel have briefed local medical personnel on PCB health hazards and emergency treatment, and met with interested members of the community to answer their questions.
- In Triana, Alabama, CDC hoped to conduct further studies to ascertain the health effects of already documented high levels of exposure to DDT and PCBs in the population from earlier CDC studies. However, additional studies have been delayed pending legal action and resolution of other issues with the community.
- A CDC physician has been assigned full-time to the State of Massachusetts. He is currently assisting them in their follow-up studies of possible association between environmental hazards and cancer at Woburn and other areas.
- At Love Canal, New York, CDC began in October of last year a new study to determine if there was a significant difference in chromosomal changes between a group of Love Canal residents and a matched control

group. The laboratory chromosome analysis of white cells from the blood specimens collected has just been completed, as has the coding of interview questionnaires. We expect to complete detailed statistical analyses of these data and issue a report by the end of this year.

The fourth area of our Interagency Agreement with EPA calls for the development of additional health studies at potential Superfund sites. As we develop these proposals we will be submitting them to EPA for funding under separate Interagency Agreements. As I mentioned earlier with reference to our activities at the North Hollywood Dump site in Memphis, Tennessee, we hope to have a finished health study proposal to EPA for funding consideration by the end of this month.

We are currently in the developmental stage of a number of other health study proposals. In addition to trying to determine the potential exposure and possible resultant health effects at individual sites, we are exploring ways to study multiple sites simultaneously to see if we can address the broader health issues. For example, are there health risks associated with abandoned waste sites? If so, what is the nature of those risks and how severe are they? To address these issues we are designing exposure studies and health effects studies that can be replicated at multiple sites across the country to give us a large enough data base to produce statistically significant results.

Worker safety and health, the fifth area of our Interagency Agreement, is of particular concern to us because, if they are not adequately protected, the clean-up crews and other workers at hazardous waste sites are more likely than others to suffer adverse health effects.

Under a NIOSH-EPA Interagency Agreement signed March 2, 1982, NIOSH will provide guidance to EPA in protecting EPA clean-up workers at hazardous waste sites. Under a Memorandum of Understanding signed on December 18, 1980, by NIOSH, EPA, the Occupational Safety and Health Administration, and the U.S. Coast Guard, NIOSH will develop comprehensive guidance materials to be used in updating the National Contingency Plan, a worker education bulletin on hazardous waste clean-up, and a strategy for training waste site coordinators and others who will then train clean-up workers.

- To provide guidance to EPA in protecting clean-up workers, NIOSH will evaluate the EPA occupational health and safety programs for 30 hazardous waste sites selected jointly by EPA and the Institute. At five of the 30 sites, NIOSH will also conduct industrial hygiene sampling to help characterize the types of substances and the levels of exposure to which workers are potentially exposed. The evaluations made at these 30 sites, and the full environmental sampling and analysis of toxic material at five of the 30, will provide EPA guidance in clean-up efforts at other sites. Final selection of the 30 sites for evaluation is nearly complete. In the meantime, the first of the five sites to receive full industrial hygiene services has been identified. NIOSH will begin work at this site, near Beaumont, Texas, next month.

- NIOSH has also begun drafting a two-volume Comprehensive Guidance Manual to be used in updating the National Contingency Plan. Volume one of the manual will deal with clean-up operations at remedial sites, i.e., those where hazardous wastes are known to exist and where clean-up will be undertaken but where no emergency exists. NIOSH has drafted the first of five chapters in this volume and submitted it to EPA, OSHA, and the Coast Guard for review. Work on the first of five chapters of volume two, which deals with emergency clean-ups, is also under way. NIOSH expects to complete the final draft of both volumes before the December 11, 1982, deadline for updating the National Contingency Plan.

o NIOSH has also completed a draft of its worker education bulletin to promote safe work practices in clean-up operations and to alert workers to the potential dangers of clean-up. The draft was delivered to EPA, OSHA, and the Coast Guard in June 1982 for their review before publication of the document. NIOSH has also begun assembling an information file of pertinent scientific and technical materials. So far more than 1800 journal articles and other materials have been obtained. The file will be used as a resource in developing additional publications to guide workers and industry in clean-up efforts.

o The strategy for clean-up worker safety and health training is designed to put into operation at the worksite the information developed for the Comprehensive Guidance Manual and the worker information bulletin. NIOSH has begun developing instructional materials that will be used to train the on-site coordinators and administrators in clean-up operations. These persons will then train the clean-up workers.

The final area of our Interagency Agreement covers expansion of the toxicology data base for health effects -- including both the addition of chemicals to existing HHS information systems and recommendations for toxicological testing of chemicals for which adequate health data does not now exist.

To accomplish the former task, the National Library of Medicine has initiated the establishment and maintenance of an automated inventory of literature and data on potential toxic substances, with particular reference to the known health effects of these substances. Recommendations for the addition of these substances to the data base will be provided by the newly created Subcommittee for Hazardous Waste Information Evaluation of the HHS Committee to Coordinate Environmental and Related Programs. This Subcommittee is composed of scientists from the National Library of Medicine, National Institue of Environmental Health Sciences, National Toxicology Program, National Cancer Institute, Centers for Disease Control and the Food and Drug Administration. This interagency approach should insure the proper priority setting for determining both the chemicals and the categories of information to be included in the data base.

The same Subcommittee will also be responsible for evaluating which of these priority substances have insufficient health effects information. The National Toxicology Program will then be responsible for reviewing these chemicals and developing protocols for toxicological testing to produce needed health effects information. As is the case of health studies, such testing is not funded under the current agreement with EPA and will require separate agreements.

Mr. Chairman, in addition to discussing our Superfund implementation activities, your letter requested we also address our work with EPA in assessing the health implications of their environmental monitoring data at Love Canal.

On May 21, 1980, the neighborhood outside the first two rings of homes surrounding Love Canal was designated a disaster area by the Federal Emergency Management Agency (FEMA). On June 4, 1980, the residents of the neighborhood were informed that the EPA and HHS would conduct a series of studies and gather information regarding their health status and any increased risk to health associated with living in that neighborhood. EPA then developed a protocol for an environmental monitoring study in the area to determine the extent and amount of contamination attributable to chemicals from the Love Canal. Field work for the study began in August 1980 and more than 6,000 samples of air, soil, water, and biota (plants and animals) were collected for analysis.

On March 4, 1981, the Acting Administrator of EPA wrote to Secretary Schweiker asking that HHS provide an interpretation of the health implications of the environmental monitoring test results when they were available. Public Health Service scientists involved in this effort included experts from the Centers for Disease Control and the National Institute of Environmental Health Sciences of the National Institutes of Health.

In late May 1981 the raw data including the results of over 100,000 laboratory test results were shown to the PHS scientists in a meeting at Research Triangle Park, North Carolina. The PHS team recommended that the raw data be arrayed in a manner which would facilitate a health assessment. The EPA staff agreed.

On August 7, 1981, after several weeks of staff negotiations, Dr. John Hernandez, the Deputy Administrator of EPA, and I signed an agreement under which HHS would review the EPA test results to assess their health implications for the residents of the Love Canal neighborhood. In this agreement it was understood that EPA had already conducted an internal audit of the sampling and analysis procedures and that the National Bureau of Standards (NBS) would independently review the study for precision and accuracy. We also agreed that if the NBS review lead to questions or modifications regarding the EPA data, HHS would be given an opportunity to revise its findings. The PHS scientists who met in May with EPA to examine the raw data were asked to conduct the review for HHS.

The PHS team assumed the responsibility for making a professional judgment regarding the implications of the test results made available from EPA in four areas:

1. Are the concentrations measured significantly different from levels found in other areas of Niagara Falls?

2. Do the levels measured represent concentrations that could cause acute or chronic adverse health effects in people living in the Love Canal area beyond what might be expected under usual residential conditions in the Niagara Falls area?

3. Were sufficient samples taken and analyzed to determine the extent of contamination by particularly hazardous materials and to be able to assess their potential threat to human health?

4. Based on available data, can it be concluded that the area is not habitable?

It is important to note that these questions were asked only in respect to the test data results for the area outside the canal itself and outside the first two rings of homes surrounding the canal. This outside area has been referred to as the "declaration area."

The PHS team arranged for a group of non-government scientists with a variety of disciplines and representing the broad spectrum of views regarding the impact of environmental exposures to hazardous substances on human health be asked to examine the data and offer their opinions in response to the questions posed. This group met in Atlanta on August 13, 1981, and each of the 11 outside reviewers provided his opinion to the PHS team within 3 weeks of the meeting.

The PHS team conferred frequently during the month of September to draft a statement of general considerations and responses to the four specific questions. Their report (which is now part of the public record) was submitted to me and to the Secretary's office for review on October 7, 1981, and transmitted to Dr. Hernandez on November 20, 1981, as written by the PHS team. The PHS team considered the views of the outside group in developing their response, but the HHS report transmitted to EPA on November 20, 1981, reflects the professional opinion of the PHS team. The PHS team noted that the test results provided by EPA, with the exception of dioxins found in the storm sewers and their drainage tracks, were in the same range in the declaration area as the levels found in the control areas. Since these data were presumed to be acceptable, the PHS team drafted responses to each of the four questions and included recommendations to EPA. I am submitting a complete copy of our report for the record. The written comments of the 11 outside reviewers were attached to the HHS report and have been made public.

HHS was not asked to participate in the review of the EPA monitoring program conducted by NBS. The NBS report was made available to HHS on May 12, 1982. The NBS review concludes that EPA did not adequately address the problems of limits of detection and sensitivity of analytic methods used. The PHS team reviewed the NBS report and concluded that the critique by NBS was such that they could not state with reasonable assurance that the area was as habitable as other comparable neighborhoods. This view was transmitted to EPA in a modification of the HHS report for June 15, 1982. We realized at the time that we modified our statement that the citizens of the Love Canal area, who had anxiously awaited a statement regarding habitability based on the environmental monitoring study, were going to be disappointed by our inability to offer a recommendation. In our view we had two options, either to 1) recommend against a return to the neighborhood because prudent public health practice dictates erring on the side of safety in the absence of confirmed environmental testing data; or 2) to enter into active discussions with the EPA and NBS scientists in an attempt to clarify the issues and satisfy ourselves that the data could not be used to make a statement regarding habitability. EPA and NBS professional staff were eager to include HHS in their discussions. After a series of phone calls, principally between EPA and PHS staff, a meeting was held on July 8th, which included HHS, NBS, and EPA. In that meeting we asked EPA to assure us that the organic toxicants of interest which were reported to be non-detectable were indeed not present in levels greater than the low parts-per-~~m~~billion range. We also asked NBS for a written statement confirming their verbal assertions in the July 8th meeting that the methods used by EPA in arriving at their conclusions were acceptable given the currently available technology.

On July 9 both NBS and EPA provided written statements regarding these technical issues which we accepted. Given the NBS and EPA statements the PHS team reaffirmed their original statement regarding habitability. That is, the levels reported in the declaration area outside the canal itself and the surrounding two rings of houses are not significantly different from comparison neighborhoods and present minimal health risk. The potentially toxic materials found have not been shown to cause illness in people at the levels reported. This judgment, of course, is based on current medical and toxicological knowledge and was made in response to a clear need to make a recommendation to the citizens of the Love Canal area.

This opinion was not based solely on the evidence contained in the EPA documents. The PHS staff who drafted the statement are familiar with the data from the environmental studies done by New York State in the same area from which the EPA samples were taken. The results of the two environmental studies are consistent and provide further support for the statement that the declaration area outside the canal and the two rings of homes surrounding it is as habitable as control areas to which it was compared.

The PHS statement also contains a firm recommendation that the toxic substances, particularly the dioxins, found to be present in the storm sewers and the creek beds must be cleaned up. Also, it is imperative that the remedial work already done on and around the canal be permanently monitored and maintained.

Mr. Chairman, I am pleased with the work of the team of PHS scientists. They worked long and hard on a project over which they had little control. They met the timetables set for them and had the courage to make clear statements of professional opinion in a complex and controversial scientific field after thorough discussion and deep thought. Each of them deserves our admiration and respect.

I hope this summary gives you and other members of the Committee an idea of the variety of health activities we are engaged in under Superfund, and of our involvement at Love Canal.

I would be happy to answer any questions you may have.

LOVE CANAL - CHRONOLOGY

1890's	William Love digs canal
1942-53	Active dumping of chemical works
1953-1960's	Neighborhood development around Love Canal
Mid-1970's	First reports of chemicals appearing around dump
Spring 1978	Initial environmental testing and health questionnaire by NYSDH
August 1978	Evacuation of first two rings of homes
Fall 1978 - Fall 1979	Drainage construction work
1979	Community health survey by Dr. Paigen and residents
January 1980	EPA chromosome study started
May 1980	EPA chromosome study reported Federal disaster declaration EPA/HHS agree to do environmental and health studies
August-October 1980	Field work phase (specimen collection) for EPA environmental study completed
March 1981	EPA (Barber) writes HHS (Schweiker) to request discussion on health review of data when EPA analysis is completed
May 27-29, 1981	PHS meets with EPA to review raw data
June 19, 1981	PHS (Heath) requests data in manageable format
July 24, 1981	EPA (Hernandez) asks HHS (Schweiker) to keep all data confidential
July 27, 1981	EPA (Deegan) transmits environmental monitoring test results to PHS (Heath) with request to keep data "strictly confidential"
August 6, 1981	PHS appoints a group of non-Government reviewers
August 7, 1981	EPA (Hernandez) sends formal agreement to HHS (Schweiker) outlining the terms and conditions and scope of the PHS health review
August 13, 1981	PHS scientists meet with non-Government reviewers (and EPA) in Atlanta

September 15, 1981	PHS scientists submit their report (and comments of non-Government reviewers) to PHS and HHS
October 7, 1981	PHS and HHS accept the report of the PHS scientists as written
November 20, 1981	HHS (Brandt) transmits the PHS report to EPA (Hernandez)
May 12, 1982	EPA (Deegan) gives PHS (Hardy) a copy of: (1) draft Vol. I of the EPA report, (2) the NBS review, and (3) an EPA staff memorandum (Deegan to Riordan) responding to the NBS review
June 14, 1982	PHS (Brandt) transmits a modified statement regarding habitability to EPA (Hernandez)
June 29, 1982	EPA (Dewling) writes to PHS (Heath) with further information in support of the EPA data and analysis
July 1982	EPA and NBS meet to discuss the NBS report--HHS invited, but could not attend
July 8, 1982	EPA, HHS, and NBS meet to discuss the EPA and NBS reports
July 9, 1982	EPA provides additional analytic data and assurances to HHS
July 9, 1982	EPA provides HHS with written statement from NBS clarifying their position
July 13, 1982	PHS (Dickson) provides EPA (Hernandez) with a statement re-affirming the original HHS position on habitability

ENVIRONMENTAL DEFENSE FUND

STATEMENT OF
KHRISTINE L. HALL
AND
DR. ELLEN K. SILBERGELD

BEFORE THE

ENVIRONMENTAL POLLUTION
SUBCOMMITTEE

OF THE

SENATE COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS

August 4, 1982

1525 18th Street, N.W. Washington, DC 20036 ☎ 202•833•1484
OFFICES IN: NEW YORK, NY (National Headquarters); WASHINGTON, DC; BERKELEY, CA; DENVER, CO

Mr. Chairman, members of the Subcommittee, thank you for the invitation to testify today. My name is Khristine Hall. I am testifying on behalf of the Environmental Defense Fund (EDF) and its 47,000 members. I am an attorney with EDF and co-chair of EDF's Toxic Chemicals program. With me today is Dr. Ellen Silbergeld, a toxicologist and the other co-chair of EDF's Toxic Chemicals Program.

The goal of the Toxic Chemicals Program is to minimize or prevent the non-voluntary exposure of people and the environment to toxic chemicals. In furtherance of that goal, EDF vigorously supported passage of Superfund legislation in 1980 and has closely monitored its implementation and enforcement since enactment of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). EDF has been an active participant in major litigation and rulemakings under that statute.

We welcome this opportunity to give you our assessment of where Superfund stands some twenty months after enactment. Given the delays, disruptions, and program direction that have characterized the program over the past year and a half, Congressional oversight is important. When Congress passed CERCLA in 1980, they envisioned creation of a program that would provide both the financing and incentives to insure quick and adequate cleanups of hazardous waste sites and other releases of toxic chemicals. Congress intended that a coordinated effort among several federal agencies be rapidly set in motion to assure that public health and national resources be safeguarded from releases of toxic chemicals

That goal has not been met. The National Contingency Plan, the cornerstone of Superfund, was delayed for over a year and then published in a much weakened form. Key regulations governing natural resource damage asseessment will be late. Citizens directly affected by sites on EPA's action list have been closed out of the process of choosing remedial action. EPA's action on the Love Canal demonstrates the Agency's lack of commitment to protection of public health based on sound information and science. And, most importantly, very little has been accomplished in terms of actual cleanups or in taking the necessary preliminary steps to cleanup hazardous waste sites. We will address each of these issues individually.

The National Contingency Plan

Three weeks ago, EPA released the final version of the National Contingency Plan (NCP). The NCP, in the words of Mrs. Gorsuch, is the cornerstone of the Superfund program, containing the procedures and standards by which spill and site cleanups will be performed. Under section 105 of CERCLA, the NCP was to have been revised and repromulgated by June, 1981. The NCP was issued a year late after EDF and the States of New Jersey and Connecticut sued EPA to force promulgation of the Plan. EPA vigorously and steadfastly (and, fortunately, unsuccessfully) resisted the Court's and Plaintiffs' efforts in that suit to impose a reasonable deadline upon the Agency for promulgation.

Ironically, the document finally promulgated on July 16 may not have been worth the fight, since the final NCP is very weak. The NCP was meant to define and coordinate the roles of the numerous federal, state, and local agencies involved in cleanups as well as provide adequate guidance to allow timely decisions to be made on cleanups of hazardous waste sites and toxic chemical spills. The promulgated NCP does not do that. In the name of "flexibility," the NCP is unacceptably weak in defining roles and providing meaningful goals for cleanups. We fear the result will be continued confusion, inconsistency in the program, and the selection of band-aids as remedies to gaping wounds.

With regard to the crucial issue of choosing a particular cleanup option for a leaking site, for instance, the final NCP provides nothing more than a set of factors to consider in the selection process. Alternatives for cleanup are chosen for study based on cost, environmental effect and the feasibility of the technolgy within each option. The final choice, according to the NCP, will be the alternative the Agency determines is cost-effective, the lowest cost alternative which provides "adequate" protection of public health and the environment. Significantly, the Agency has specifically rejected suggestions to define "adequate" in terms of existing health and environmental standards. The Agency clearly contemplates cleanups which will not result in the removal of contaminants from drinking water, surface water, or air sufficient to meet federal standards already in place.

By not defining the goals of cleanup efforts, EPA retains almost unlimited discretion to chart the future of the Superfund program. This lack of certainty regarding the extent of cleanup means each site will be treated differently, depending upon the state and the individuals involved, and the political and verbal strength of the local commuity. The result will undoubtedly be delays and inadequate cleanups at some sites.

There are several important reasons why a baseline goal of environmental protection is absolutely necessary to successfully clean up Superfund sites and why the NCP, which does not provide such a baseline, is consequently useless. First and foremost, the baseline ensures the public adequate protection as required by the law. Second, it provides a target upon which to design an engineering solution; without such a target, an adequate engineering solution cannot be defined or designed, and there is no way to determine if the engineering solution has been constructed and implemented correctly. Third, the baseline minimizes controversy and the extent to which political pressure determines the course of the remedial action.

EDF maintains that the criteria and standards promulgated by EPA and other federal or state agencies are suitable for use in establishing the baseline for environmental cleanups. They have been upheld in court and reflect the input of considerable comment. They represent the minimum protection required by the law and thus are the minimum standards acceptable for any cleanup.

It is instructive to compare the NCP to the land disposal regulations issued by EPA just one day later. Under the RCRA regulations, an owner/operator who has contaminated an aquifer must take corrective action to remedy the problem. Under the NCP, a responsible party who has contaminated an aquifer may escape without doing anything, because EPA can choose a "no-action" alternative as the most cost-effective remedial option.

Under the RCRA regulations, the owner/operator must restore the contaminated aquifer to drinking water standards, or background levels of contamination for chemicals not covered by those standards. Under the NCP, as stated above, there are no performance standards for Superfund cleanups.

The RCRA regulations also specify the type of remedial work that EPA would consider acceptable from an owner/operator who has contaminated an aquifer:

> EPA does not believe that measures which only prevent migration of hazardous constituents in the groundwater for some period of time provide an adequate level of

> protection. Such approaches simply defer adverse groundwater effects until some later time. Therefore, EPA does not believe measures which only modify the gradient in the aquifer or create barriers (e.g. slurry walls) provide a fully adequate solution under the subtitle C program. Such measures can, however, be combined with other measures, such as counterpumping, to constitute an adequate corrective action program.

No similar statement can be found in the NCP or any Superfund policy directives of which are we aware.

It is difficult to understand the huge difference in approaches under the two programs. Of course, in one instance, the Superfund program is addressing problem releases caused by past disposal practices, and in the second instance, the RCRA program is addressing contamination resulting from present and future disposal practices. In addition, Superfund requires EPA to employ cost-effectiveness criteria when choosing a remedy. Nevertheless, the purpose of both programs is to provide the public with long-term protection of human health and the environment. In both instances, hazardous wastes will have escaped from the facility and the Agency will need to decide how to rectify the problem. In terms of protecting the health and environmental well-being of those who live near these sites, it makes little difference whether the contamination comes from an old site or a new site. The effect is the same.

Natural Resource Damage Assessment

Section 301 of Supefund mandates promulgation of regulations by December 11, 1982 for the assessment of damages to natural resources resulting from hazardous substance releases and oil spills. Unfortunately, there has been an almost total lack of progress toward developing these important regulations. As an example of the magnitude of the problem, the just released annual report of the President's Council on Environmental Quality reveals that the number of reported industrial spills and other pollution incidents resulting in fish kills increased from less than 400 annually in the 1960's to over 600 annually in the 1970's. The average number of fish killed in such incidents over that period was over 30 million annually.

Under Section 111, claims for "injury to, or destruction or loss of, natural resources," including fish and wildlife resources, resulting from hazardous substance spills are included among the authorized expenditures from Superfund. Such claims may only by asserted by the United States or the individual states as trustees of the damaged natural resources. Compensable claims include those for the cost of restoring, rehabilitating, replacing, or acquiring the equivalent of damaged natural resources.

However, before any monies can be disbursed from the Fund to pay natural resources damage claims, the claimant must prove the value of its claim. To enable claimants to make that proof, Congress sought the development of a standardized system for natural resources damage assessment through the promulgation of natural resources damage assessment regulations. These regulations are made even more significant because they also will apply to provisions of Section 311 of the Clean Water Act concerning damage caused by oil pollution.

Under Superfund, then, the promulgation of natural resources damage assessment regulations is essential to the orderly filing of claims by the States or by the United States and to the expeditious receipt of compensation from the Fund for natural resources damage resulting from hazardous substance releases. Promulgation of the required regulations is therefore, essential to the implementation of the express will of Congress in establishing a comprehensive system for addressing the critical environmental problem of hazardous substance releases.

On August 14, 1981, President Reagan delegated the responsibility for developing the natural resources damage assessment regulations to the Secretary of the Interior. Exec. Order No. 12316, 46 Fed. Reg. 42237, 42240 (August 20, 1981). In the time that has elapsed since Secretary Watt assumed that responsibility, no Interior Department personnel have been assigned to develop the required regulations. Instead, the Department has engaged in a dispute for the past year with EPA about whether DOI or EPA is obligated to provide the necessary funding to develop the regulations. Only in recent weeks has DOI acknowledged that it must pay the costs of its assigned task. Nevertheless, with less than five months remaining until the statutory deadline for promulgating the regulations, there is no indication that DOI will be ale to promulgate the regulations on time.

Because natural resources damage assessment regulations are critically important to the public and, especially, to States seeking to alleviate the effects of hazardous substance releases, we are distressed by Secretary Watt's complete failure thus far to carry out his duty to develop and promulgate natural resources damage assessment regulations. This failure is the more egregious since there already exist at the state level numerous methodologies that appear consistent with Congressional intent and may be suitable for adaptation.

Congress envisioned that the regulations would encompass two approaches to natural resources damage assessment. For minor hazardous substance releases, Congress envisioned generic damage assessment regulations which, based on the size and type of the release and the size and type of the area affected, would yield a damage value. For major releases, Congress contemplated regulations that would set forth field procedures for assessing natural resources damages and, based on the field assessment results, yield a damage value. Several states, among them California, Alaska, Washington, Virginia, and Florida, have adopted natural resources damage assessment procedures that may be consistent with one or the other of the two approaches. At the very least, these existing procedures provide useful models from which the development of Superfund regulations could be initiated.

EDF recognizes that the task of promulgating natural resources damage assessment regulations by December 11, 1982, will not be simple, particularly since three-fourths of the time Congress allotted for this purpose has now passed without progress. Yet, it is imperative that the Department begin immediately to develop those regulations so that it can both meet the statutory deadline and enable the States to recover the sums to which they are entitled.

Citizen Participation

More than any other federal statute, Superfund mandates actions that have a direct impact on local residents and concerned citizens. The quality of their lives and their children's lives will be dependent on the timeliness and adequacy of cleanups. Superfund was passed specifically to address these localized problems and protect the health and welfare of the citizens who drink contaminated water and breathe foul air emanating from dumps and other releases.

It is a matter of common sense, then, that local citizens be integrally involved in decisions regarding cleanups. The lack of specificity for cleanups in the NCP makes it even more imperative that persons directly impacted by the Superfund sites be involved in the decisionmaking process, so that their concerns can be adequately addressed. EPA, to date, however, has allowed for only token involvement of local citizens.

Last month, EDF invited over 30 representatives of local organizations concerned about 20 of the original list of 115 sites to Washington discuss common problems concerning Superfund implementation. One of the most striking complaints of those attending was that the people who were most affected by the program were being systematically prevented from effectively participating in it. Requests for data and reports were often denied by EPA; when the information was provided, insufficient time was provided to review the document. Voluntary agreements and administrative orders regarding cleanups were being negotiated with responsible parties and signed by the Agency without any opportunity for input by other affected parties. Public hearings, when held, were announced in papers 50 miles from the site and served only to justify decisions already made by EPA.

The NCP as promulgated last month does not contain meaningful guidance on this sensitive issue. Instead, the NCP contains only one clause concerning public participation, stating that response personnel should "to the extent practicable be sensitive to local community concerns." Indeed, EPA's meager efforts in this area are revealingly called "community relations" rather than "citizen participation."

On June 4, the group of 30 citizens invited to Washington by EDF met with Mrs. Gorsuch and directly voiced their complaints about lack of citizen input . She did not deny the problem existed. At her invitation, citizens are now preparing public participation guidelines for the Superfund program and will submit them by September 7. 1982 (see attached letter). It is a serious matter when persons directly affected by government action or inaction cannot participate effectively to try to influence the outcome. We trust Mrs. Gorsuch will seriously consider this matter. We also invite your attention to it.

Love Canal Report

This section is directed towards the role of Superfund legislation as a means of increasing our national ability to deal with the legitimate concerns of citizens over environmental contamination and potential adverse health effects. Superfund correctly recognized that instances of chemical outbreaks from hazardous waste dumpsites should provide information on health effects and other issues relevant far beyond the specific instances of these outbreaks.

Love Canal crystallized the issues concerning hazardous waste dumpsites, and largely inspired the Congress to pass Superfund legislation. In many ways, Love Canal continues to provide important insight into the problems which now surround implementation of Superfund.

Critical to the appropriate application of Superfund as a mechanism for dealing with situations like Love Canal are: a reliable assessment of environmental contamination, and an acceptable evaluation of the potential adverse health effects. A critical examination of the Love Canal report issed on July 14, 1982, guides this attempt to explore the preparedness of the EPA and its adequacy in understanding the problems of hazardous waste dumpsites.

Much confusion and contention has already developed concerning this report, primarily focussing the acceptability of its conclusions. More fundamentally, oversight should be concerned with the adequacy of its design, and the reliability of its data. In order to judge these two issues appropriately, we have considered the data of the report in its entirety, evaluated and recalculated the statistical measures, and examined in depth the material related to quality control, precision, and reliability. Before presenting our conclusions, it is important to note the chronology of the Love Canal investigations which culminated in this report.

In late summer and early fall of 1980, EPA undertook environmental sampling of the so-called Declaration Area . Samples of air, water, and soil were collected for analysis by selected subcontracting analytic laboratories. The abilities of these laboratories to meet minimum performance standards varied and was not uniformly ascertained before the study was initiated. The initial study design was focussed on the quantitative question of contamination. That is, could it be determined whether or not chemicals from the dumpsite at Love Canal had moved into the Declaration Area. The appropriate approach to answering this question was to sample within the structure of an isopleth, so that the surrounding area could be adequately characterized in terms of chemical contamination and correlated with distance from the Canal itself. At some point, this design was abandoned, and the data were stratified on a strict comparison basis, that is, comparing results from samples from the Declaration Area with those taken from other areas (so-called control areas within Niagara Falls). Relatively few sites were sampled from the control area. By late spring 1981, the analyses appear to have been largely completed, and the EPA began to evaluate the results. At that point the Department of Health and Human Services was asked to assist in answering the question of habitability, now phrased in terms of comparability to other areas in Niagara Falls, and not explicitly in terms of habitability per se.

In the summer of 1981, the Centers for Disease Control convened a meeting of 10 consultants to assist in the evaluation of the report. The document made available by EPA to the consultants was in draft, and much of the supporting data was difficult to comprehend. Significant questions were raised by the consultants and by CDC as to the adequacy of sampling methodology and details of data anlysis. Sometime that same summer, EPA submitted its material to the National

Bureau of Standards in order to obtain answers to these important methological questions.

In May 1982, the NBS sent a detailed review of the Love Canal study to the EPA. That extensive and careful review was not favorable -- more accurately, in terms of a peer review critique, it was extremely adverse. Based on this review, on June 14, 1982, the CDC and NIEHS submitted an opinion of the Love Canal report which stated that "with the data now available to us, no definite recommendations or conclusions as to the habitability or the potential human health risks of the Love Canal area can be made."

On June 28, the EPA sent further information to NBS concerning such issues as limits of detection and quality assurance. These were critical matters since most of the anlayses reported concentrations of chemicals below the limits of detection, and were therefore critically dependent upon the actual limit of detection in the hands of each laboratory, for each chemical not detected. Lack of actual quantitative concentration figures reduce the comparison to detect versus nondetect.

On July 9, following a meeting the day before of CDC, NIEHS, EPA, and the Department of Justice, NBS again refused to certify the data contained in the EPA report and pointed to unresolved problems concerning precision, accuracy, and minimum detection limits, which fundamentally tainted the conclusions of the report. Nevertheless, on July 13, CDC revised its original comments and cautiously endorsed the statement that the Declaration Area of Love Canal was "as habitable as the control areas with which it was compared." The statements of CDC were carefully, and appropriately, based on the explicit assumption that EPA could meet the remaining objections of NBS.

An examination of all the material publicly available -- including the 1981 draft report, the comments of the CDC consultants, the inter-agency correspondence, and the final Love Canal report in its entirety -- demonstrates that the EPA has not answered the fundamental problems concerning the interpretability of its data. The data in this report are so fundamentally flawed that no judgement concerning the extent of chemical contamination of the Declaration Area, or the habitability of this area, can be made. This is a difficult conclusion to reach. It does not imply in any way that the Declaration Area is not habitable. We can only conclude that no one yet knows the answer to that question. Quite simply, most of the data are nonexistent, because they are reported as below detection. This turns out to be a dimensionless number. Recoveries and reliability estimates were haphazardly done, and the variance of the data, when computable, appears to be as much as almost three orders of magnitude in some instances.

The progress of this investigation has disturbing lessons for all concerned. The EPA appears unable to live by the well-established codes for obtaining data and ascertaining its validity. While EPA claims to have adhered to the American Chemical Society's guidelines for conducting environmental analysis (a copy of which is attached), this did not occur. Their failure undercuts Agency's numerous assertions that they are trying to improve EPA's decisionmaking by using better science.

Of greater concern, in the Love Canal report, we are confronted by three agencies of government, unable to devise an integrated approach to dealing with the Love Canals of the present and future. The performance of the EPA in this instance demonstrates how essential it is to implement effectively the provisions of Superfund related to developing such instruments of competence as health registries and toxicology data banks. Other agencies of government, with special expertise in such areas as analytic methodology and health assessment, cannot be called in at the last minute to rapidly bless reports. As Dr. Clark Heath of CDC has noted, there is a lack of clarity as to responsibilities of various echelons and entities confronted with contamination; particularly, there is no established procedure for enlisting the CDC in evaluating action and potential health effects. "We should lubricate the system so it works better." (NAS, Plans For Chemical and Epidemiological Follow-up After Area-wide Chemical Contamination, Washington, 1982.) Agencies, such as CDC AND NBS, must be involved from the beginning, to certify that study designs are appropriate to the questions asked, that methods are appropriate and that contracted laboratories are competent. The placement of CDC personnel in regional EPA offices is encouraging, but full disbursement of funds for health effects research remains to be accomplished. Most importantly, the information collected under such guidelines, at Love Canal and other sites, must be incorporated into a comprehensive process which will strengthen our national ability to deal with environmental issues with increasing insight based on usable experience.

Lack of Accomplishments

EDF is disturbed by the delays and lack of progress being made in planning for and actually cleaning up hazardous waste sites. Concrete figures and reliable information are not generally available to the public on EPA's progress under Superfund. Nevertheless, EDF remains unconvinced by EPA's largely unsubstantiated rhetoric that good progress is being made.

EPA's record through July 9, 1982 is the following:

(1) $60.35 million has been allocated for remedial action (long-term cleanups). Of this, only $31.92 million has actually been obligated for remedial action. When $31.92 million is added to $28.90 million obligated for removal actions (short-term), the total amount of money obligated becomes $60.82 million . This is a drop in the bucket in

comparison to total of $255 million actually available to the Agency through the end of FY 1982.

(2) Cooperative agreements with state officials have been signed for only 20 sites.

(3) Cleanups undertaken by private parties have amounted to only $12 million.

(4) Out of 115 sites, only 29 remedial investigation/ feasibility studies have been initiated and only 8 have been completed. These figures, more than any, undercut EPA's assertion that good progress is being made. The remedial investigation/feasibility study is the most critical phase of cleanup, since it identifies the nature and extent of the problem and outlines remedial options. If we are to expect adequate progress on cleanups and actual construction in the near future, sites must be moved through this phase in a timely manner. Based on EPA's own figures, this clearly is not occurring.

(5) Engineering designs have been initiated at nine sites and completed at five.

(6) Actual cleanup work has been started at two sites and completed at one (a removal action costing less than $1 million).

(7) Enforcement is not producing results. The Agency's much vaunted negotiation process has produced only three agreements since last December.

These are not encouraging figures. They demand an explanation. Possible reasons for delays are the following:

(1) The tardiness and weakness of the National Contingency Plan mean that policy decisions as to the level of activites and cleanup have to be made anew at each and every site.

(2) Ongoing enforcement action by state or federal officials may be blocking progress on cleanup. EDF agrees that private parties should, wherever possible, take remedial action instead of the Fund. EDF is concerned, however that efforts of the enforcement office and the Superfund office are not well coordinated and that in many instances the pendency of asserted but undetectable enforcement effort is being used an excuse for lack of action. In particular, we are concerned that the critical stage of remedial investigation/feasibility study is not occurring while enforcement is pending. The baseline information generated in this stage would be valuable in any enforcement context and puts EPA in the best positon to proceed expeditiously in the even negotiations break down.

(3) Lack of EPA personnel is contributing to delays. Personnel in EPA headquarters overseeing the Agency's efforts are stretched very thin. EDF has reason to believe that an internal EPA memorandum asserts that EPA could accomplish more under Superfund if it were given more personnel. In addition, the Agency's FY 83 budget submission reveals enforcement resources will only be able to handle 15 ongoing remedial

action cases, 10 new cases, 14 voluntary agreements, and 15 administrative orders during FY 83. These are not impressive numbers when dealing with a list of 400 sites and enforcement is the preferred course of action.

(4) Delays in signing cooperative agreements with states have also played a role. One possible reason for this is that states have only recently begun to realize the possible financial impact of Superfund. Superfund's requirement that states contribute 50% of the cost of cleaning up municipally owned or operated sites has caused second-thoughts about participation. Even Superfund's requirement that a state contribute 10% of the financing means a substantial financial sum in those cases where extensive cleanup is required. Moreover, states are beginning to realize that the remedial option with the least cost immediate price tag probably has the highest cost long-term operating and maintenance price tags, a state responsibillity. For these and other reasons, states have been slow to sign cooperative agreements, delaying progress at the sites.

It is very difficult, given the lack of good information, to determine the precise cause of the delay in implementation at each site. EDF strongly urges that this committee request GAO to investigate in depth a cross section of the sites on the original list of 115 and to survey the remaining sites to determine the causes of delaly and what corrective action should be taken. Among the questions which should be answered are: (1) What is the status of state or federal enforcement efforts at the site and has enforcement been well coordinated with program efforts? (2) Will lack of specificity in the NCP contribute to delays in action? (3) Why have there been delays in signing cooperative agreements? (4) Will the state be able to contribute its financial share?

The GAO should also determine whether lack of EPA personnel is contributing to delays. We also understand that EPA officials have recently begun to express doubt whether $1.6 billion will be sufficient to clean up the 170 sites already listed. Perhaps GAO should address this issue as well.

In addition, GAO should address the issue of quality control. EPA should have in place, but apparently does not, a quality assurance program to make sure we do not end up malfunctioning unworkable behemoths.

Conclusion

Progress to date has been excruciatingly slow, with little to show in the way of accomplishments. EDF feels a major review and investigation is order to insure that the program moves ahead more rapidly in the future.

We thank you for the opportunity to testify and will be happy to answer any questions.

ENVIRONMENTAL DEFENSE FUND

June 7, 1982

Administrator Gorsuch
Environmental Protection Agency
Washington, D.C.

Dear Administrator Gorsuch:

We represent concerned citizens and groups from 20 of the first 115 Superfund sites around the United States. We thank you for meeting with us on Friday, June 4th, to discuss the implementation of Superfund by your agency at these hazardous waste dumpsites. Our experience with the identification, assessment, and remediation of these sites has taught us how essential the right of public participation is to the effective implementation of Superfund.

At our meeting on Friday, you agreed to consider our recommendations for minimum guidelines for citizen participation in Superfund. We welcome the opportunity to respond. Meeting over the weekend, we have agreed on the following general principles that should shape such guidelines. We intend to provide you with detailed draft guidelines within 90 days. These basic principles for citizen participation are:

--- participation of concerned citizens from the beginning to the end of the decisionmaking process, from discovery of the problem to and after proposed or actual remedial action;

--- explicit structure for citizen participation;

--- opportunity to participate in each decision, including settlements with responsible parties, before finalization;

--- timely notification of all steps in the process before they are taken, with reasonable time allowed for comments or other response;

--- early, immediate, and complete access to information;

--- access to appropriate technical expertise through government and other sources in advance of governmental action;

--- convenient, timely public hearings held at locations reasonably accessible to concerned citizens, prior to any decision;

--- periodic progress reports publicly issued by the EPA, with provision for citizen comment;

--- publication of complete listing of government contact persons (with telephone numbers).

Thank you again for meeting with us and for your invitation to provide these guidelines.

Yours sincerely,

James McCarthy
Concerned Citizens Committee
of Jackson
Jackson, N.J.

Raymond Troy
West Pennsylvania Citizens
for a Safe Community
Kennerdell, PA.

George Campbell
Bradford Citizens Against
Unsafe Environment
Milan, PA.

Martha Bailey
W.A.S.T.E.
Newton Junction, N.H.

Linda Spinney
Concerned Neighbors in Action
Riverside, CA.

Lee Galen
Concerned Citizens to Save
Our Environment
Morganville, N.J.

Baron Hill
Seymour, IN

Sally Mueller
Alma, MI.

Nancy Troy
West Pennsylvania Citizens
for a Safe Community
Kennerdell, PA.

Patricia Pelkofer
Group Against Smog and
Pollution
Pittsburgh, PA.

Joseph Nazzaro
For a Cleaner Environment
Woburn, MA.

Jackie Russell
W.A.S.T.E.
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Penny Newman
Concerned Neighbors in Actio
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Barbara Vecchiarelli
Concerned Citizens to Save
Our Environment
Morganville, N.J.

Mederic Beauchesne, Jr
Epping, N.H.

N. T. "Brother" Greene
Cypress Health and Safety
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Administrator Gorsuch

Cynthia B. Clemmer
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Environment Information Services
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Bonnie L. Exner
Citizens Against Lowry Landfill
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Marilyn Skolnick
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Marion Sykes
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NATIONAL WILDLIFE FEDERATION
1412 Sixteenth Street, N.W., Washington, D.C. 20036 202—797-6800

STATEMENT OF DR. JAY D. HAIR, ON BEHALF OF THE NATIONAL WILDLIFE FEDERATION AT HEARING ON SUPERFUND IMPLEMENTATION, BEFORE THE ENVIRONMENTAL POLLUTION SUBCOMMITTEE, COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, UNITED STATES SENATE, AUGUST 4, 1982

Mr. Chairman and Subcommittee Members:

I am Jay D. Hair, Executive Vice President of the National Wildlife Federation. On behalf of the more than 4.2 million members and supporters of the Federation, and our 53 state and territorial affiliate organizations, I commend you for holding this hearing and thank you for the opportunity to present our views.

Since other witnesses are addressing other aspects of the National Contingency Plan and Superfund Implementation, I will restrict my remarks to one important issue which has unfortunately not received the attention it deserves. I refer to the responsibility Congress vested in the Executive Branch under Section 301(c)(1) of CERCLA to develop regulations within 2 years for assessing damages for injury to natural resources resulting from oil and hazardous substance releases. Despite the critical need for such damage assessment regulations, and with the statutory deadline barely half-a-year away, virtually nothing has been done to even begin the mandated rulemaking process.

It is tempting and understandable to ignore or subordinate concerns about fish and wildlife and other natural resources to the very dramatic and tragic direct impacts of hazardous wastes on human health and welfare. The victims of Love Canal and other shameful episodes have a clear claim on the American conscience and must receive priority attention. However, we dare not forget our place in the web of life or neglect the terrible toll that hazardous waste releases have had on other species and on the habitat we share. In the annals of hazardous waste infamy the James River Kepone disaster, which primarily affected fish and shellfish (and the fishing industries they supported), surely deserves no less prominent attention than episodes like Love Canal and Valley of the Drums.

I worry greatly about the role of hazardous wastes in human cancer and disease. But I am, if possible, even more troubled by the chronic contamination of our environment and our foodchain with chemicals which thwart the ability of birds and mammals and other species to reproduce and perpetuate their kind. The peregrine falcon, the brown pelican, and other species, were brought to the brink of extinction by the careless use and disposal of toxic chemicals. Although some among us might not mourn the passing of these creatures, we must remember that the basic biochemistry of the species that have suffered reproductive impairments upon exposure to persistent chlorinated organic chemicals differs little from our own.

There is no environmental insult more deadly than inhibition of reproduction. When the ability to reproduce is impaired, the species' very survival is threatened.

In short, we all have a very direct and vital stake in protecting our natural resources from the ravages of hazardous wastes (and toxic chemicals, whatever their origins).

The magnitude of the "substantial and enduring" damages to natural resources in the United States attributable to toxic chemicals was documented in two reports considered by this Committee in developing its Superfund bill (S. Rept., supra, at 3).

One report, a Congressional Research Service "catalogue" of natural resources lost or destroyed through releases of hazardous or toxic substances,*/ identified damaged resources ranging from all five of the Great Lakes to the aquifer underlying the San Joaquin Valley, possibly the richest agricultural area in the United States (S. Rept., supra, at 3,6). This report is almost 250 pages long and contains 219 entries (some involving multiple incidents), but is not exhaustive in its coverage.

A second report, prepared by EPA,**/ identified some 250 hazardous waste sites involving damages or significant threats of damages. Among the reported incidents were 74 sites where natural habitats had been damaged and were adversely affecting indigenous species. (S. Rept., supra, at 4).

This Committee took particular note of the closure of portions of Lakes Ontario and Erie to commercial fishing because of chemical contamination and of the ban on taking of Coho salmon (stocked throughout the lakes to encourage a viable commercial and sport fishing) because of chemical contamination (S. Rept., supra, at 5).

Natural resource damage is doubtless also a feature of a number of the some 150 Superfund sites designated for priority cleanup attention throughout the country. For example, indications are that serious natural resource damages are threatened by at least three of the top 10 Superfund sites: Tar Creek (Oklahoma/Kansas), Neal's Landfill (Indiana), and the Nyonza Chemical Waste Dump in Massachusetts.

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*/ "Resource Losses From Surface Groundwater and Atmospheric Contamination: A Catalogue", by the Congressional Research Service, Library of Congress, for the Committee on Environment and Public Works, U.S. Senate, March, 1980.

This Committee acknowledged the significance of hazardous waste damage to natural resources two years ago. In reporting out a Superfund bill, it concluded that "damage to natural resources due to releases of hazardous wastes is a very serious problem" with environmental ramifications that "can be regional or national...in scope" and both short-and long-term in extent. (S.Rept. No. 848, 96th Cong., 2d Sess. 84 (1980)).

The legislation developed by this Committee also sought to protect natural resources by making hazardous waste releasers strictly liable for resulting natural resource damages; empowering the Federal and State Governments, acting as trustees on behalf of the public to go to court against responsible releasers to recover for such damages; and making Trust Fund moneys available for use to restore, rehabilitate, or replace natural resources that have been damaged. The Committee made clear, in connection with these kinds of remedial actions, that they "be accomplished in the most cost-effective manner possible." (S.Rept., supra, at 85.)

A specific mandate to develop a standardized system for assessing natural resource damage, "which is efficient as to both time and cost", was included in the bill because of the clear "need for an improved, fair and expeditious mechanism for dealing with natural resource damages caused by releases of hazardous materials" (S.Rept., supra, at 85). The Committee felt that the need could be met only through standardized regulations developed "after a thorough review of alternatives for damage assessment" and designed to select

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**/ "Hazardous Materials Incidents Reported to U.S. Environmental Protection Agency Regional Offices from October, 1977, through September 1979", EPA, January, 1980.

"the best simplified procedures for making accurate and defensible assessments of resource damages". (Id.)

Recognizing the limitations and complexities of the art of damage assessment, the Committee provided a 2-year period for issuance of initial regulations with subsequent reviews and updates on a regular basis every two years, (S. Rept., supra, at 86).

Two general types of regulations were contemplated--each presenting formidable challenges to the creativity and determination of agency rule-writers. The demanding nature of this assignment makes it especially distressing that the Interior Department (delegated by the President to carry out this task) has done virtually nothing over the past year-and-a-half to get this difficult, but vital, process underway.

The two kinds of regulations contemplated by this Committee are:

1) A simplified type of regulation to effectively deal with damage assessment in connection with most "minor" releases. This type of regulation would rely primarily on "a combination of habitat values, tables of values for individual species, and previously conducted surveys and laboratory studies, related to units of discharge or units of affected area" (S.Rept., supra, at 86).

2) Another, more elaborate, type of regulation to deal with large or unusually damaging releases, which would be used to guide a site-specific damage assessment. This kind of regulation would have to include (a) protocols for field assessment of the type and extent of short-and-long-term damage; (b) methodologies for determining their value; (c) procedures for assessing the value of direct losses of organisms and their habitat; (d) procedures for

assessing the value of indirect losses of organisms and habitat through ecological interactions (S. Rept., supra, at 86).

The Committee made clear its intent that the damage assessment regulations be designed to facilitate "thorough site investigation in a cost effective manner" and to recommend monetary cost assessment procedures "which are the most accurate and efficient for accomplishing the mandates" of CERCLA (S.Rept., supra, at 86).

To illustrate the factors involved in past efforts at natural resource assessment, I would like to submit for the record (EXHIBIT I) a recently published paper co-authored by our General Counsel.

One of the unfortunate consequences of Interior's failure to pursue the development of damage assessment regulations in a timely manner is, therefore, the lack of clear guidance for doing cost-effective field assessments and for doing accurate and efficient monetary cost assessments. This inevitably leads to one of two undesirable results. Either inefficient and inaccurate assessments will be done--which will require a needlessly large expenditure of time and resources to complete and constantly repeat for each separate site or release that is investigated. Or--and this is far more likely--it will mean that natural resource damages will remain uncompensated and unredressed. This concern is bolstered by the fact that the National Contingency Plan (NCP) directs the natural resource trustee agencies to assess natural resource damages in accordance with the damage assessment regulations mandated by Sec. 301(c)(1).
In the absence of these regulations, the NCP could be read to preclude any such damage assessments.

It will hamper the full recovery from responsible releasers of full remuneration for natural resource damages, because of uncertainties as to what costs to assess and how to give them monetary values. And it will greatly complicate the task (or increase the expense to the Fund) of assessing the cost of and taking action to implement remedial actions to restore, rehabilitate, or replace damaged natural resources (because of the need to constantly repeat ad hoc damage computations for each site being evaluated).

As I've indicated, the Superfund Executive Order (#12316, August 14, 1981) explicitly delegates the federal responsibility for promulgating natural resource damage regulations to the Secretary of the Interior. Within Interior, the Office of Environmental Project Review has been tasked with this function. We were shocked and dismayed to discover that Interior has done virtually nothing to date to carry out this regulation-writing responsibility. I wrote Secretary Watt on July 12th to express our sense of alarm and disappointment over this unfortunate situation. Our letter also requested that the Secretary provide us with detailed information on the status of Interior's efforts to implement the rule-writing task mandated by Sec. 301(c)(1) of Superfund. I have as yet received no reply. I hope this subcommittee will also seek a full report from Secretary Watt on this matter. (A copy of my letter is submitted for the record as EXHIBIT 2.)

Although lack of adequate funding is the reason given for this deplorable lack of action, we have seen no evidence of any effort to acquire the needed funds apart from a protracted battle among the lawyers at EPA and Interior over whether Trust Fund moneys can lawfully be used to underwrite the administrative costs of writing damage assessment regulations. Specifically, the EPA General Counsel opined--more than a year ago, on June 30, 1981--that there is no authority in CERCLA to pay the costs associated with Sec. 301(c)(1), which is a Title III activity, since Sec. 111(a) permits payment out of the Fund only for those administrative costs "reasonably necessary for and incidental to" implementation of Title I of CERCLA. This legal opinion was quickly followed, on July 24, 1981, by a diametrically contrary opinion from Interior's Associate Solicitor for Conservation and Wildlife. More recently, EPA's Associate Administrator for Legal and Enforcement Counsel and General Counsel, in a June 21, 1982, Memorandum reiterated the EPA position, specifically rejecting the Interior Department's legal analysis.

Regardless of whose lawyers were right, I find it incredible that a full year was wasted because of unproductive haggling among agency lawyers.

I understand that Interior has now reluctantly and belatedly resigned itself to making provision for the needed funding in its own budget for FY 1984. The utter inadequacy of this step is evident from the fact that it does not allow the rule-writing process to even begin for another 14 months. Meanwhile, the two-year deadline specified in the Act will expire on December 11th of this year.

The irony of all this is that the necessary funds apparently amount to only about $300,000.

My recommendation to this subcommittee is that it convey to the Secretary of the Interior in the strongest terms its desire to see Sec. 301(c)(1) implemented as rapidly and aggressively as possible. The Secretary should be encouraged to pursue all available means of securing immediate funding to develop and promulgate legally required damage assessment regulations. Available means which should be pursued include reprogramming of the modest funding levels needed from budgeted but dispensable resource development activities.

If necessary to get the rule development effort underway more quickly, EPA should be urged to advance the needed moneys from the Trust Fund--subject to later reimbursement by Interior. This would be a wholly proper use of Trust Fund moneys since the development of damage assessment regulations for natural resources is "reasonably necessary" to effective implementation of natural resource protection responsibilities under Title I as well as under Title III. Repayment of these outlays to the Fund should accommodate EPA's concerns and ensure that maximum resources remain available for emergency response and clean-up functions.

In conclusion, I commend this Subcommittee and Committee for your important efforts to secure vital legal protections for natural resources which are damaged or threatened by hazardous waste releases. I hope and trust that you will not allow the Interior Department to undo these efforts through inaction.

Thank you for the opportunity to present these views.

EXHIBIT I

Recovery of Damages by States for Fish and Wildlife Losses Caused by Pollution

*Faith Halter**
*Joel T. Thomas***

INTRODUCTION

During the early morning hours of February 2, 1976, a tank barge carrying approximately 19,700 barrels of oil sank while in tow up the Chesapeake Bay.[1] Much of the oil it was carrying escaped into the waters of the Bay off Smith Point, just below the mouth of the Potomac River. Since the use of the Chesapeake Bay by wintering waterfowl was near its peak at the time of the spill,[2] the release of the oil destroyed large numbers of waterfowl and other aquatic creatures, in spite of massive cleanup efforts by the United States, the Commonwealth of Virginia, and private individuals.

Several months after the barge sank, the owner, Steuart Transportation Company, filed a complaint seeking exoneration from or limitation of liability for the damages caused by the oil spill.[3] Both the United States and the Commonwealth of Virginia filed claims.[4] The claim filed by Virginia totalled approximately $731,500;[5] of this amount, $635,325 was for the loss of waterfowl.[6] After trial on the issue of liability, but before determination of damages, the case was settled.[7]

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** J.D., Ohio State College of Law; General Counsel, National Wildlife Federation.

[1] Complaint of Steuart Transp. Co., 435 F. Supp. 798, 800 (E.D. Va. 1977), *aff'd sub nom.* Steuart Transp. Co. v. Allied Towing Corp., 596 F.2d 609 (4th Cir. 1979).

[2] Personal Conversation with George Reigel, Conservation Editor, Field & Stream (Feb. 20, 1976).

[3] Complaint of Steuart Transp. Co., 435 F. Supp. at 801.

[4] *Id.*

[5] Comptroller General of the United States, Total Costs Resulting from Two Major Oil Spills 4 (June 1, 1977) (letter from Comptroller General to Chairman, Subcommittee on Environment, Energy, and Natural Resources).

[6] *Id.* at 3.

[7] Personal Conversation with Staff Member, Office of Attorney General, State of Virginia (May 20, 1981).

The *Steuart* case demonstrates the substantial potential for destruction of fish and wildlife posed by pollution discharges, one side effect of industrial activity.[8] While large scale destruction of wildlife by pollution is not new, the idea that states can or should seek to recover compensatory damages for their destruction seems quite recent.[9] During the last ten to fifteen years, an increasing number of states have actively begun to seek compensatory damages for such losses.[10]

As part of the preparation of its proof of damages against Steuart Transportation Company,[11] the state of Virginia, through the office of the Attorney General, hired two consultants[12] to prepare testimony regarding the "economic" value of the waterfowl. The Attorney General's office also asked the National Wildlife Federation for any assistance it could provide. That inquiry prompted this article. The authors conducted a survey of all state attorneys general and fish and wildlife agencies, finding a wide variance in the frequency and sophistication of state efforts to recover compensation for large scale losses of fish and wildlife. While most of these efforts have been successful,[13] they have received only limited judicial scrutiny because many of the cases are settled prior to trial.[14] This Article analyzes the several bases for state recovery actions, and investigates and describes various methods for establishing the monetary value of the fish and wildlife destroyed.

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[8] *See* U.S. ENVIRONMENTAL PROTECTION AGENCY, FISH KILLS CAUSED BY POLLUTION IN 1975 (1975). (*See also* similar reports for 1976 and 1977.)

[9] While it is impossible to say with certainty when the first action was brought to recover damages for the large scale loss of fish and wildlife, such actions seem to have been rare, prior to the late 1960s. The authors have reached this conclusion partly on the basis of a survey of state fish and game agencies and state Attorneys General which they conducted in 1977-78 and updated in 1981 [hereinafter cited as "Authors' Survey"], and partly on the lack of reported cases before the 1960's. A copy of a letter sent to state game and fish agencies in conducting the Authors' Survey is appended to this Article as Appendix II.

[10] See sources cited in notes 31 & 32 *infra*.

[11] Steuart Transportation Company agreed to pay approximately $140,000 in damages, of which $115,000 was for the destruction of waterfowl. Personal conversation with Staff Member, Office of Attorney General, State of Virginia (May 20, 1981). A major reason for the difference between the latter figure and the original claim for waterfowl losses was the estimated extent of the loss. *Id.* The state originally claimed a loss of 40,837 waterfowl, whereas the final settlement figure was based on an actual body count of about 10,000 birds. *Id.* The attorney handling the case recommended this approach after discovering that the basis for the estimate of the state's expert witness that 3-4 birds were lost for each found was based on experience acquired in the field, rather than formal research. *Id.*

[12] The consultants are the authors of an important book in this area. J. HAMMACK & G. BROWN, WATERFOWL AND WETLANDS: TOWARD BIOECONOMIC ANALYSIS (1974).

[13] Authors' Survey, *supra* note 9.

[14] Many states reported that all of their suits were settled through negotiation: Alabama, Arizona, Arkansas, Georgia, Kansas, Kentucky, Massachusetts, Mississippi, New Mexico, and Texas. Authors' Survey, *supra* note 9. In addition, Illinois reported that virtually all of its cases were settled. *Id.*

I
WHY SUE?

Two separate considerations justify state efforts to recover damages for the destruction of fish and wildlife from pollution. First, there is a traditional legal justification, which is simply that when one person wrongfully destroys or injures the property of another (in this case the citizens of the state), the injured party is entitled to compensation.[15] Since fish and wildlife have been considered as property of the states in which they live,[16] a state should no more forego compensation for large-scale destruction of fish and wildlife than for destruction of any other public property, such as trees in a state forest or books in a state library. Just as the state would not be expected to ignore damages to these resources, it should not be expected to ignore the destruction of fish and wildlife within its jurisdiction. Second, state actions to recover damages can be justified on grounds of economic efficiency.[17] To the extent that persons causing fish and wildlife losses are not held financially accountable, the costs of these losses are "external" to those persons—the public pays these costs directly, while there is no impact on the polluters' business costs.[18] In this situation, polluters have no economic incentive to reduce these fish and wildlife losses, because the cost of prevention will always be greater than the cost *to them* of the fish and wildlife destroyed.[19] This is true even if the value to the public of the fish and wildlife is greater than the cost to the polluters of preventing the loss.

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[15] C. MCCORMICK, HANDBOOK OF THE LAW OF DAMAGES § 137 (1935); 22 AM. JUR. 2d *Damages* §§ 2, 11, 12 (1965).

[16] See notes 26-56 *infra* and accompanying text.

[17] A recent commentary has noted the role of economic analysis in this context:

> The concepts which must be understood before the connection between environmental problems and the economy is clear are the role of prices in allocating resources, the damaging environmental consequences of the free use of valuable resources that as yet have no prices, and the manner in which these resources can be given prices. In a market economy . . . prices perform the key function of allocating all types of resources—raw materials, production capacity, goods, services—to their most efficient use . . . .
>
> However, many environmental resources are still unpriced and remain outside the market. Because ownership rights have not been assigned to them, and because they are not easily broken up into units that can be bought and sold, such valuable environmental assets as watercourses, the air mantle, landscape features, [fish and wildlife,] and even silence are 'used up,' but their use is not accurately reflected in the price system. Economists describe the harms caused by such use [of the environment] as 'externalities,' because the burden [*i.e.*, loss] of the resources consumed falls on society at large, not just the user who actually consumes them.

F. ANDERSON, A. KNEESE, P. REED, R. STEVENSON, & S. TAYLOR, ENVIRONMENTAL IMPROVEMENT THROUGH ECONOMIC INCENTIVES 3-4 (1977). For a more complete explanation of the rationale for valuing fish and wildlife losses, see *id.* at 21-38.

[18] COUNCIL ON ENVIRONMENTAL QUALITY, SIXTH ANNUAL REPORT 494-570 (1975); K. MÄLER & R. WYZGA, ECONOMIC MEASUREMENT OF ENVIRONMENTAL DAMAGE: A TECHNICAL HANDBOOK (1976); Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960); Jackson, *Foreword: Environmental Quality, the Courts, and the Congress*, 68 MICH. L. REV. 1073 (1970); Comment, *Internalizing Externalities: Nuisance Law and Economic Efficiency*, 53 N.Y.U. L. REV. 219 (1978).

Insofar as the legal system requires polluters to indemnify the public, via the state, for the destruction of fish and wildlife, they will need to "internalize" (recognize on their books) at least part of the losses. As this happens, polluters will seek to maximize their profits by minimizing damage to fish and wildlife.[20] This will be a rational course so long as the cost of avoidance (the amount spent to prevent an incremental loss of fish and wildlife) is less than the cost avoided (potential liability for that incremental loss).[21] Eventually, this behavior should result in a more efficient allocation of resources.[22]

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[19] Although recognizing that there may be some nominally noneconomic incentives for reducing fish and wildlife losses, such as the desire to avoid bad publicity, this Article will not discuss such incentives.

[20] "The basis of an economic approach to law is the assumption that the people involved with the legal system act as rational maximizers of their satisfactions [*i.e.*, profit]." Posner, *The Economic Approach to Law*, 53 TEX. L. REV. 757, 761-63 (1975).

[21] Coase, *supra* note 18, at 3.

[22] This conclusion entails placing an economic value on wildlife, a step possibly upsetting to many people. The two main objections are that putting a value on wildlife is morally wrong and that, since it is impossible to determine the full value of wildlife, any such attempt is useless. One author has stated:

> Nowhere is ecological ineptitude more clearly demonstrated than in the notions of cost-benefit and tradeoffs. An economist who suggests that we set a money value to the fish or amenity that may be destroyed by a power plant, and submit the cost-benefit ratio to a public vote, is proposing an evil and senseless procedure. This notion that we can assign money values to such diverse matters as clean water, fisheries, pleasing scenery, kilowatts, and parking lots is a recent contribution of man's hubris, especially when we make a decision on the basis of this arithmetic of apples and oranges that may extirpate other species from the scene and set irreversible ecological decay in motion; this notion is reprehensible. The idea of assigning a dollars and cents value to life—any life—can lead to the end of life on earth as it now does to the exhaustion of non-renewable resources, a mining-out of life as if it were some raw material. This approach to the problem of environmental insult assumes that the processes of nature are simple and can be safely tampered with in terms of our idiotic anthropocentricism.

Hedgpeth, *Seven Ways to Obliteration: Factors of Estuarine Degradation*, in 2 ESTUARINE POLLUTION CONTROL AND ASSESSMENT 723, 725 (Proceedings of a conference held on Feb. 11-13, 1975 and published by the U.S. Environmental Protection Agency, Office of Water Planning and Standards) (footnote omitted). The primary answer to both objections is the same. The economic system does place a monetary value on fish and wildlife resources, and that value—zero—is much more inaccurate, or morally wrong, than one economists could develop. A second answer is that by assessing compensatory damages for fish and wildlife destroyed by pollution, courts need not advocate the use of these valuation methods for other purposes, such as planning. It is also important to recognize that valuing wildlife losses for purposes of calculating compensatory damages does not imply any sanction of the infliction of those losses. By way of analogy, the courts of this country are faced daily with the ugly, but nonetheless necessary, task of establishing the value of individuals who have been killed by some act of negligence. Clearly, determining a person's value after his or her death for purposes of compensatory damages does not presuppose that anyone willing to pay the price may destroy human beings.

In this context, it should be emphasized that the reason for seeking damages for the destruction of fish and wildlife is compensation, not deterrence. Traditional criminal penal-

II
AUTHORITY TO SUE

If a state files suit for injury to wildlife, questions may arise as to the state's authority to recover damages. The cases fall into two groups: those in which state legislation authorizes the action, and those in which no such legislation has been enacted.

Claims predicated on express statutory authority pose few problems. The power of the state to pass laws for the conservation and protection of resident wildlife dates from at least medieval times,[23] and such laws are a legitimate exercise of the general police power. Thus the United States Supreme Court recently stated:

> We consider the States' interests in conservation and protection of wild animals as legitimate local purposes similar to the States' interests in protecting the health and safety of their citizens.[24]

About three-fifths of the states have enacted laws specifically authorizing the state fish and wildlife agency, or the state Attorney General, to recover compensatory damages for the destruction of fish and wildlife.[25] So far as the authors have been able to determine, no one has ever challenged the authority of a state to recover damages for the loss of fish and wildlife, where the action was predicated on specific legislation.

In the absence of such legislation, state efforts to obtain compensation for wildlife losses have rested, without careful distinction, on one or more of three common law theories—state ownership, trusteeship, or guardianship as parens patriae of a public resource.[26]

The authority of a state to seek injunctive relief as parens patriae for a collective injury to a substantial number of its citizens, where no private citizen has standing to bring such an action, is well established.[27] By definition no individual can own a wild animal,[28] but

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ties or a system of civil fines deliberately set above the "real" value of the resources would best obtain deterrence.

[23] T. LUND, AMERICAN WILDLIFE LAW 21-24 (1980).

[24] Hughes v. Oklahoma, 441 U.S. 322 (1979).

[25] Authors' Survey, *supra* note 9. The states are Alabama, Alaska, California, Colorado, Florida, Georgia, Hawaii, Illinois, Kansas, Kentucky, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Virginia, Washington, West Virginia, Wisconsin, and Wyoming. *Id.* Legislation is pending in Minnesota, Montana, and Puerto Rico. *Id.*

[26] State Dep't of Fisheries v. Gillette, 27 Wash. App. 815, 621 P.2d 764, 766-67 (1980); Department of Envt'l Protection v. Jersey Cent. Power & Light Co., 133 N.J. Super. 375, 392, 336 A.2d 750, 759 (1975), *rev'd on other grounds*, 69 N.J. 102, 351 A.2d 337 (1976).

[27] Hawaii v. Standard Oil Co., 405 U.S. 251, 258-59 (1971) and cases cited therein.

[28] *E.g.*, New Mexico State Game Comm'n v. Udall, 410 F.2d 1197, 1200 (10th Cir.), *cert. denied*, 396 U.S. 961 (1969); Tlingit & Haida Indians of Alaska v. United States, 389 F.2d 778, 785 (Ct. Cl. 1968); Stevens v. State, 89 Md. 669, 672-73, 43 A. 929, 930 (1899); People v. Monterey Fish Prods. Co., 195 Cal. 548, 563, 234 P. 398, 404 (1925).

Courts have occasionally granted standing to a private individual who has suffered spelating wildlife are subject to the same analysis under the commerce clause as any other form of state regulation.[46] Applying the appropriate standard,[47] the Court found that the Oklahoma statute was discriminatory on its face,[48] and also that it was not the least discriminatory alternative available to achieve the state's legitimate purpose of maintaining an adequate supply of minnows in its waters.[49]

Had the majority stopped there, *Hughes* would be of little interest to this Article. The majority opinion, however, dismissed the concept of state ownership of fish and wildlife as "no more than a 19th-century legal fiction expressing 'the importance to its people that a State have power to preserve and regulate the exploitation of an important resource' . . . ."[50] One might conclude from this statement, and from several others like it in the opinion,[51] that the Court had somehow "invalidated" the common law doctrine regarding state ownership of resident fish and wildlife. A careful reading of the opinion shows, however, that the Court probably did not intend such a result,[52] and thus did not intend to foreclose state wildlife regulations that do not impermissibly restrict interstate commerce.[53]

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[46] *Id.* at 335-36.

[47] The Court used the standard of:

> (1) [w]hether the challenged statute regulates evenhandedly with only 'incidental' effects on interstate commerce, or discriminates against interstate commerce either on its face or in practical effect; (2) whether the statute serves a legitimate local purpose; and if so, (3) whether alternative means could promote this local purpose as well without discriminating against interstate commerce.

Id. at 336.

[48] *Id.*

[49] *Id.* at 337-38.

[50] *Id.* at 335 (citation omitted).

[51] *E.g.*, *id.* at 335-36; *id.* at 338-39.

[52] Thus the federal district court in Maine v. M/V Tamano, 357 F. Supp. 1097 (D. Me. 1973) rejected the argument that the state's authority under common law to recover damages for fish and wildlife had been invalidated by the Supreme Court's characterization of the state ownership doctrine as a "legal fiction." *Id.* at 1100 n.6. In Puerto Rico v. SS Zoe Colocoltroni, 628 F.2d 652, 672 (2d Cir. 1980), the Court of Appeals for the Second Circuit rejected a similar challenge to the state statute that was the basis for recovery.

Moreover, even if it had intended to do so, it is questionable whether the Supreme Court has authority to invalidate the common law doctrine of state ownership of wildlife. Article III of the U.S. Constitution does not purport to authorize the Court to decide all questions relating to property rights, much less to decide whether or not the state is the owner of certain natural resources. To the extent that a ruling on the validity of the common law doctrine is not necessary to the disposition of a question within the Article III subject matter jurisdiction of the Supreme Court, a ruling on this issue would be of questionable authority.

[53] Thus the Supreme Court has stated that:

> The overruling of *Geer* does not leave the States powerless to protect and conserve wild animal life within their borders. Today's decision makes clear, however, that States may promote this legitimate purpose only in ways consistent with the basic principle that 'our economic unit is the Nation,' and that when a wild animal 'becomes an article of commerce . . . its use cannot be limited to the citizens of one State to the exclusion of citizens of another State.'

Hughes v. Oklahoma, 441 U.S. at 338-39 (citations omitted).

Whether or not the state "owns" fish and wildlife ferae naturae,[54] the Court did not mean to imply that states lack authority to protect their wildlife. Indeed, the Court emphasized that its decision would not impede the legitimate state interest in protecting these resources:

> the general rule we adopt in this case makes ample allowance for preserving, in ways not inconsistent with the Commerce Clause, the legitimate state concerns for conservation and protection of wild animals underlying the 19th-century legal fiction of state ownership.[55]

While *Hughes* will not bar common law damages actions for the loss of fish and wildlife, it does indicate that courts are more likely to scrutinize carefully the state's common law theories than in the past. Consequently, states seeking compensation for these losses without specific statutory authority should explicitly invoke their authority as parens patriae, rather than merely relying on the state ownership doctrine. Since state authority to recover damages as parens patriae is not yet firmly established, it is advisable to eliminate this potential uncertainty with legislation authorizing a state agency to sue for the value of fish and wildlife destroyed by pollution.[56] A model statute that may resolve this and other problems is appended to this Article.

III
SUPERFUND

A. Overview of the Act

As a practical matter, enactment of the Comprehensive Environment Response, Compensation, and Liability Act of 1980 (Superfund)[57] may have provided in many cases a statutory basis for an action to recover damages for the loss of fish and wildlife. Superfund makes individuals who release a hazardous substance liable for damages for injury to, destruction of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction, or loss.[58]

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[54] The difficulty with *Hughes* is that it does not understand that the problems created by *Geer* arose not because the Court attributed ownership of fish and wildlife to the state, but because of the curious consequences that it assigned to that ownership in 1896. To correct the error in *Geer*, there was no need to determine whether the state was in fact the owner of fish and wildlife. Regardless of the answer, the state could not condition subsequent ownership in a way that placed an undue burden on interstate commerce. Thus, the Court's discussion of the state ownership doctrine was superfluous.

[55] Hughes v. Oklahoma, 441 U.S. at 335-36.

[56] Puerto Rico v. S.S. Zoe Colocoltroni, 628 F.2d 652 (2d Cir. 1980) illustrates this point. In *Zoe*, the court avoided the "difficult question" of whether a state's unexercised regulatory authority over fish and wildlife would support an action for recovery of compensatory damages for their destruction, by finding that the Commonwealth of Puerto Rico had legislation authorizing one of its agencies to maintain such an action. *Id.* at 671-72.

[57] 42 U.S.C.A. §§ 9601-9657 (1980 Laws Special Pamphlet) [hereinafter "Superfund"].

[58] Superfund provides:

courts have long recognized that the doctrine of parens patriae applies to the protection of natural resources.[29] The law is not, however, entirely settled on whether a state's interest as parens patriae will support an action for damages. The U.S. Supreme Court has twice sidestepped this issue,[30] but lower federal and state courts have usually allowed the recovery of damages for injury to natural resources.[31] Courts upholding an action for damages based on parens patriae have focused on the importance of protecting these valuable natural resources.[32] The two courts which rejected an action for damages focused on the lack of precedent and the state's lack of technical proprietary ownership.[33]

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cial damages from the loss of wildlife, such as injury to a commercial fishing operation. *E.g.*, Burgess v. M/V Tamano, 370 F. Supp. 247, 250 (D. Me. 1973) and cases cited therein.

Some legal theories have been advanced that would enable individuals to play an active role in efforts to conserve wildlife. One possibility is to allow a state resident, as a beneficiary of the public trust, to seek a writ of mandamus to compel the state to protect the trust corpus of resident wildlife. *See* Marks v. Whitney, 6 Cal. 3d 251, 261-62, 491 P.2d 374, 381-82, 98 Cal. Rptr. 790, 797-98 (1972). The adoption of this strict an interpretation of the doctrine of public trusteeship appears unlikely at present. Another suggestion has been to allow persons to sue as the guardians of certain natural resources, including fish and wildlife. Stone, *Should Trees Have Standing?*, 45 S. CAL. L. REV. 450 (1972). Those familiar with the problems of guardianships will realize the complexity and severe limitations of this theory, which is directed toward the substitution of a more resource-oriented trustee in the place of the state.

[29] *E.g.*, North Dakota v. Minnesota, 263 U.S. 365 (1923) (flooding caused by change in drainage system); New York v. New Jersey, 256 U.S. 296 (1921) (discharge of sewage); Georgia v. Tennessee Copper, 206 U.S. 230 (1907) (air pollution); Missouri v. Illinois, 180 U.S. 208 (1901) (discharge of sewage).

[30] Hawaii v. Standard Oil Co., 405 U.S. 251 (1972); Georgia v. Pennsylvania R.R. Co., 324 U.S. 439 (1945).

[31] See cases cited in notes 25 & 26 *infra*. *See generally* Bean, *Law and Wildlife: An Emerging Body of Environmental Law*, 7 ENVT'L L. RPTR. 50,013 (1977); Cohen, *The Constitution, the Public Trust Doctrine, and the Environment*, 1970 UTAH L. REV. 388; Hayes & Evans, *State Recovery for Wildlife Destruction: New Life for an Old Doctrine*, 2 INT'L SCH. L. L. REV. 13 (1978); Sax, *the Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970); Note, *State Protection of its Economy and Environment: Parens Patriae Suits for Damages*, 6 COLUM. J. L. & SOC. PROB. 411 (1970); Note, *Public Trust—Injury to Public Trust is Basis for Award of Damages*, 5 SETON HALL L. REV. 394 (1974).

[32] Maine v. M/V Tamano, 357 F. Supp. 1097, 1102 (S.D. Me. 1973); Department of Natural Resources v. Amerada Hess Corp., 350 F. Supp. 1060, 1067 (D. Md. 1972); Lansco, Inc. v. Department of Envt'l Protection, 138 N.J. Super. 275, 283, 350 A.2d 520, 524 (1975), *aff'd*, 145 N.J. Super. 433, 368 A.2d 363 (1976); Department of Envt'l Protection v. Jersey Cent. Power & Light Co., 133 N.J. Super. 375, 392, 336 A.2d 750, 759 (1975), *rev'd on other grounds*, 69 N.J. 102, 351 A.2d 337 (1976); State v. Bowling Green, 38 Ohio St. 2d 281, 283, 313 N.E.2d 409, 411 (1974); Department of Fisheries v. Gillette, 27 Wash. App. 815, 621 P.2d 764, 767 (1980). *See generally* Annot., 42 A.L.R. FED. 23 (1979). Courts have also allowed recovery in maritime tort for damages resulting from an oil spill. American Waterways Operators, Inc. v. Askew, 335 F. Supp. 1241, 1247 (D. Fla. 1971), *rev'd on other grounds*, 411 U.S. 325 (1973), and cases cited therein; Department of Fish & Game v. S.S. Bournemouth, 307 F. Supp. 922, 925 (C.D. Cal. 1969).

[33] State v. Dickinson Cheese Co., 200 N.W.2d 59, 61 (N.D. 1972); Commonwealth v. Agway, Inc., 210 Pa. Super. Ct. 150, 153-55, 232 A.2d 69, 70-71 (1967). Other courts have seemingly rejected the reasoning of these cases. *See, e.g.*, State v. Jersey Cent. Power &

In contrast to these two recent state court decisions, the U.S. Supreme Court once held that a state's proprietary interest in fish and wildlife living within its borders was sufficient to allow the state to regulate the subsequent ownership of the fish.[34] In *Geer v. Connecticut*, decided in 1896, the Court upheld a statute that prohibited the transportation of wild game birds taken legally within Connecticut for sale outside Connecticut.[35] The holding in *Geer* derived from the notion that a state, by virtue of its "ownership" of game still in the wild, could condition subsequent ownership of that wildlife so as to prohibit its transportation for sale outside the state.[36] The majority in *Geer* found no violation of the commerce clause because the "sole consequence of the [challenged] provision . . . is to confine the use of such game to those who own it, the people of that State."[37] The Court also stated that "[t]he common ownership imports the right to keep the property, if the sovereign so chooses, always within its jurisdiction for every purpose."[38] The fact that Connecticut allowed the sale of game birds within its own boundaries was in the Court's view irrelevant, because that was "intrastate" as opposed to "interstate" commerce.[39]

The Supreme Court expressly overruled *Geer* in a decision that suggests the importance of proceeding as parens patriae rather than as owner of the wildlife.[40] *Hughes v. Oklahoma* involved a constitutional challenge to an Oklahoma statute prohibiting the transportation for sale outside the state of minnows obtained directly from state waters (rather than from state hatcheries).[41] The Court invalidated the statute on the ground that it violated the federal commerce clause.[42] As the Court noted in *Hughes*,[43] it had tacitly overruled *Geer* in *West v. Kansas Natural Gas Co.*[44] During the years following *Geer*, as the Supreme Court refined its interpretation of the commerce clause, the holding in *Geer* became so isolated as to amount to little more than an anomaly.[45] In *Hughes*, the Court recognized this fact and held that state laws regu-

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Light Co., 133 N.J. Super. 375, 393, 336 A.2d 750, 759 (1975). *Cf.* State, Dep't of Protection v. F.W. Fitch Co., 236 Iowa 208, 214, 17 N.W.2d 380, 383-84 (1945) (after noting that previous parens patriae suits involved injunctive relief, the court concluded that it was appropriate to extend such actions to the recovery of damages).

[34] Geer v. Connecticut, 161 U.S. 519 (1896).

[35] *Id.* at 529.

[36] *Id.* at 529-30.

[37] *Id.* at 529.

[38] *Id.* at 530.

[39] *Id.* at 530-33.

[40] Hughes v. Oklahoma, 441 U.S. 322 (1979).

[41] *Id.* at 338.

[42] *Id.*

[43] *Id.* at 329-330.

[44] 221 U.S. 229 (1911) (invalidating an Oklahoma statute that prohibited transportation of oil obtained within the state for sale outside the state).

[45] Hughes v. Oklahoma, 441 U.S. at 329-335.

However, the Act contains several very important limitations. First and foremost, Superfund does not cover oil spills.[59] Also, the Act limits liability to five million dollars for the release of a hazardous substance,

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(a) Notwithstanding any other provision or rule of law, and subject only to the defenses set forth in subsection (b) of this section—

(1) the owner and operator of a vessel (otherwise subject to the jurisdiction of the United States) or a facility,

(2) any person who at the time of disposal of any hazardous substance owned or operated any facility at which such hazardous substances were disposed of,

(3) any person who by contract, agreement, or otherwise arranged for disposal or treatment, or arranged with a transporter for transport for disposal or treatment, of hazardous substances owned or possessed by such person, by any other party or entity, at any facility owned or operated by another party or entity and containing such hazardous substances, and

(4) any person who accepts or accepted any hazardous substances for transport to disposal or treatment facilities or sites selected by such person, from which there is a release, or a threatened release which causes the incurrence of response costs, of a hazardous substance, shall be liable for—

(A) all costs of removal or remedial action incurred by the United States government or a State not inconsistent with the national contingency plan;

(B) any other necessary costs of response incurred by any other person consistent with the national contingency plan; and

(C) damages for injury to, destruction of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction, or loss resulting from such a release

(b) There shall be no liability under subsection (a) of this section for a person otherwise liable who can establish by a preponderance of the evidence that the release or threat of release of a hazardous substance and the damages resulting therefrom were caused solely by—

(1) an act of God;

(2) an act of war;

(3) an act or omission of a third party other than an employee or agent of the defendant, or than one whose act or omission occurs in connection with a contractual relationship, existing directly or indirectly, with the defendant (except where the sole contractual arrangement arises from a published tariff and acceptance for carriage by a common carrier by rail), if the defendant establishes by a preponderance of the evidence that (a) he exercised due care with respect to the hazardous substance concerned, taking into consideration the characteristics of such hazardous substance, in light of all relevant facts and circumstances, and (b) he took precautions against foreseeable acts or omissions of any such third party and the consequences that would foreseeably result from such acts or omissions; or

(4) any combination of the foregoing paragraphs.

Id. § 9607(a), (b) (1980) Laws Special Pamphlet).

[59] The Act notes that the term "hazardous substance"

> does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under subparagraphs (A) through (F) of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gass, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

Id. § 9601(14) (1980 Laws Special Pamphlet).

Since oil and most oil products are not included in subparagraphs (A) through (C), the Act is inapplicable to most oil spill situations. However, recovery for damages caused by oil spills and the release of hazardous substances may be available under the Clean Water Act, 33 U.S.C. §§ 1251-1376, 1321(f)(5) (Supp. III 197), which provides:

> The President, or the authorized representative of any State, shall act on behalf of the public as trustee of the natural resources to recover for the costs of replacing or restoring such resources. Sums recovered shall be used to restore,

or to eight million dollars if the release occurred in navigable waters.[60] Only the President of the U.S. or an authorized representative of a state acting as trustee for the affected natural resources may recover damages,[61] and the Act requires that the sums recovered under it be used for specific purposes.[62] Further, Superfund denies recovery when the damages complained of were specified in an environmental analysis and the authorizing agency granted permission for the applicant's activities.[63] Also, the Act does not allow recovery of damages resulting from a "federally permitted release"[64] and disallows recovery of dam-

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> rehabilitate, or acquire the equivalent of such natural resources by the appropriate agencies of the Federal Government, or the State government.

Another possible basis for recovery is the Submerged Lands Act, 43 U.S.C. §§ 1301-1356 (1976), which gives the states all right, title, and interest in the natural resources of the navigable waters of the United States. *Id.* § 1311 (1976).

[60] Superfund provides:

> (1) Except as provided in paragraph (2) of this subsection, the liability under this section of an owner or operator or other responsible person for each release of a hazardous substance or incident involving release of a hazardous substance shall not exceed— (A) for any vessel which carries any hazardous substance as cargo or residue, $300 per gross ton, or $5,000,000, whichever is greater;
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> (B) for any motor vehicle, aircraft, pipeline (as defined in the Hazardous Liquid Pipeline Safety Act of 1979), or rolling stock, $50,000,000 or such lesser amount as the President shall establish by regulation, but in no event less than $5,000,000 (or, for releases of hazardous substances as defined in section 4601(14)(A) of this title into the navigable waters, $8,000,000).

42 U.S.C.A. § 9607(c) (1980 Laws Special Pamphlet).

[61] The Act provides:

> In the case of an injury to, destruction of, or loss of natural resources under subparagraph (C) of subsection (a) liability shall be to the United States Government and to any State for natural resources within the State or belonging to, managed by, controlled by, or appertaining to such State: Provided, however, that no liability to the United States or State shall be imposed under subparagraph (C) of subsection (a), where the party sought to be charged has demonstrated that the damages to natural resources complained of were specifically identified as an irreversible and irretrievable commitment of natural resources in an environmental impact statement, or other comparable environmental analysis, and the decision to grant a permit or license authorizes such commitment of natural resources, and the facility or project was otherwise operating within the terms of its permit or license. The President, or the authorized representative of any State, shall act on behalf of the public as trustee of such natural resources to recover for such damages. Sums recovered shall be available for use to restore, rehabilitate, or acquire the equivalent of such natural resources by the appropriate agencies of the Federal Government or the State government, but the measure of such damages shall not be limited by the sums which can be used to restore or replace such resources. There shall be no recovery under the authority of subparagraph (C) of subsection (a) where such damages and the release of a hazardous substance from which such damages resulted have occurred wholly before the enactment of this Act.

Id. § 9607(f) (1980 Laws Special Pamphlet).

[62] Id.

[63] *Id.* Several provisions of subsection 9607(f) may require judicial interpretation. Among them are the terms "specifically identified," and "comparable environmental analysis," and the exemption for damages "authorized" by a permit or license.

[64] The Act provides:

> Recovery of any person (including the United States or any State) for response costs or damages resulting from a federally permitted release shall be pursuant to existing law in lieu of this section. Nothing in this paragraph shall affect or modify in any way the obligations or liability of any person under any other provision of

ages resulting from application of a pesticide product registered under the Federal Insecticide, Fungicide, and Rodenticide Act.[65]

While these limits may detract from Superfund's utility for suits to recover for injury to fish or wildlife, the Act specifies that in many situations it does not preempt other federal or state law.[66] Thus the Act does not preclude state statutes authorizing parens patriae suits. The Act appears to require the election of a remedy, however; any person who receives compensation pursuant to Superfund is precluded from recovering for the same removal costs, damages, or claims pursuant to any other state or federal law.[67] Conversely, any person who receives compensation pursuant to any other federal or state law is precluded from receiving compensation for the same removal costs, damages, or claims under Superfund.[68] The importance of electing a remedy will be particularly acute in cases where the identity or solvency of the person responsible for a release is uncertain, since recovery may then be

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State or Federal law, including common law, for damages, injury, or loss resulting from a release of any hazardous substance or for removal or remedial action or the costs of removal or remedial action of such hazardous substance. In addition, costs of response incurred by the Federal Government in connection with a discharge specified in section 9601(10)(B) or (C) of this title shall be recoverable in an action brought under section 1319(b) of Title 33.

Id. § 9607(j) (1980 Laws Special Pamphlet).

[65] The Act provides:

> No person (including the United States or any State) may recover under the authority of this section for any response costs or damages resulting from the application of a pesticide product registered under the Federal Insecticide, Fungicide, and Rodenticide Act. Nothing in this paragraph shall affect or modify in any way the obligations or liability of any person under any other provision of State or Federal law, including common law, for damages, injury, or loss resulting from a release of any hazardous substance or for removal or remedial action or the costs of removal or remedial action of such hazardous substance.

Id. § 9607(i) (1980 Laws Special Pamphlet).

[66] The Act provides:

> Nothing in this Act shall be construed or interpreted as preempting any State from imposing any additional liability or requirements with respect to the release of hazardous substances within such State.

Id. § 9614(a) (1980) Laws Special Pamphlet).

It might be possible to state a cause of action for injury to fish or wildlife under the federal common law of nuisance. However, a recent Supreme Court case, Milwaukee v. Illinois, 101 S. Ct. 1784 (1981), suggests that such a cause of action would not be available for injuries subject to Superfund, since that Act would be found to have preempted the federal common law remedy.

[67] The Act provides:

> Any person who receives compensation for removal costs or damages or claims pursuant to this Act shall be precluded from recovering compensation for the same removal costs or damages or claims pursuant to any other State or Federal law. Any person who receives compensation for removal costs or damages or claims pursuant to any other Federal or State law shall be precluded from receiving compensation for the same removal costs or damages or claims as provided in this Act.

Id. § 9614(b) (1980 Laws Special Pamphlet).

[68] *Id.* It is unclear whether a state could split the claims arising out of a single incident, for example by seeking clean up and removal costs under Superfund, and damages for its natural resources under a state act.

possible only against the fund created under Superfund. Where these problems do not arise, states may prefer to proceed under other federal and state laws that allow larger recoveries.

From the point of view of this Article, section 9651(c) of Superfund is probably even more important than the liability provisions noted above. Section 9651(c) requires the promulgation, within two years of the Act's enactment, of federal regulations for assessing damages for injury or destruction of natural resources resulting from a release of oil or a hazardous substance.[69] Since Superfund was adopted on December 11, 1980, initial regulations are due on or before December 11, 1982. Section 9651(c)(2) calls for regulations embodying two approaches to measuring damages. The first approach is a formula (or formulas) by which units of release or habitat affected would be multiplied by a predetermined sum.[70] The most attractive feature of this approach is simplicity. A major shortcoming is that environmental damage varies greatly according to the type of pollutant, type of habitat, and time of the year. An approach which fails to account for such factors as these will often produce an arbitrary measure of damages. This approach will be most acceptable where the environmental harm is relatively insignificant and/or relatively easy to predict, since spending large amounts of money in such a situation would not be cost-effective.

The second approach under section 9651(c) is the development of methods to make case-specific determinations of injury to natural resources.[71] This approach will usually be more appropriate for valuing large scale fish and wildlife losses, since it will be worthwhile to be accurate when the loss is significant. Because many species of fish and wildlife are transient, they may or may not be present at a particular pollution incident. Furthermore, even if a species is present, the pollution incident may not affect it. The following discussion outlines the major theories for case-specific assessments of damage.

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[69] Superfund provides:

> (1) The President, acting through Federal officials designated by the National Contingency Plan published under § 9605 of this title, shall study and, not later than two years after the enactment of this Act, shall promulgate regulations for the assessment of damages for injury to, destruction of, or loss of natural resources resulting from a release of oil or hazardous substance for the purposes of this Act and section 1321(f)(4) and (5) of Title 33.
>
> (2) Such regulations shall specify (A) standard procedure for simplified assessments requiring minimal field observation, including establishing measures of damages based on units of discharge or release or units of affected area, and (B) alternative protocols for conducting assessments in individual cases to determine the type and extent of short- and long-term injury, destruction, or loss. Such regulations shall identify the best available procedures to determine such damages, including both direct and indirect injury, destruction or loss and shall take into consideration factors including, but not limited to, replacement value, use value, and ability of the ecosystem or resource to recover.

Id. § 9651(c) (1980 Laws Special Pamphlet).

[70] *Id.* § 9651(c)(2)(A) (1980 Laws Special Pamphlet).

[71] *Id.* § 9651(c)(2)(B) (1980 Laws Special Pamphlet).

B. Difficulties in Valuation

Unfortunately, it is not possible to compute with much precision the total environmental costs of most pollution incidents.[72] This stems from both an absence of adequate baseline data[73] and an incomplete understanding of the interrelationships between the various species at any pollution site and their physical habitat.[74] At a minimum, complete evaluations of environmental costs should include the effects of pollution on the flow of goods and services (renewable resources) provided by the site; the waste assimilation capacity of the affected area; and the pollutant's impact, if any, upon public health. While some day it may be possible to make such a complete assessment of damages, this Article concerns the far more limited problem of assigning a monetary value to one of the many effects of pollution: the destruction of fish and wildlife.

The traditional measure of damages for the loss of an animal is its market value at the time of the loss.[75] Since wildlife is free from private ownership while it remains ferae naturae, and the law frequently prohibits its sale even after it is lawfully taken,[76] most species of wildlife will not have an ascertainable market price. Moreover, even when market prices are available, a fundamental difficulty arises from the fact that the value of fish and wildlife must be determined in its wild state and not in captivity or in hand.[77]

Where market value is unavailable or inappropriate, plaintiffs may prove the value of their losses by some other method, so long as that method is not too speculative, conjectural, or remote.[78] Cases dealing with compensation for injury to trees provide a useful analogy. The most common measure of damages is the difference between the value

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[72] An excellent discussion of the problem appears in K. MALER & R. WYZGA, *supra* note 18, at 6-10, 13-15.

[73] *Id.* at 53-54.

[74] *See* Sorenson, Preliminary Report: Economic Evaluation of Environmental Damage Resulting from the Santa Barbara Oil Spill 5 (July 8, 1974).

[75] *E.g.*, Arkansas Valley Land & Cattle Co. v. Mann, 130 U.S. 69, 79 (1889).

[76] T. LUND, *supra* note 23, at 63-64; 35 AM. JUR. 2d *Fish and Game* § 50 (1967).

[77] It might seem that in such circumstances the value of the fish and wildlife should be market prices less the cost of bringing them to market. In order to measure adequately the losses involved, however, one should recognize in some way the cost of maintaining the resources themselves, especially if they are actively managed resources (such as trout in the Great Lakes), as well as the cost of maintaining the resource base (the habitat required to sustain the resource pool from which the marketed individuals were drawn).

[78] *See* Story Parchment Co. v. Paterson Parchment Paper Co., 282 U.S. 555, 563-64 (1931). *See generally*, C. MCCORMICK, *supra* note 15, at § 27; 22 AM. JUR. 2d *Damages* § 25 (1965).

of the underlying land before and after the injury to the tree, but if this measure is inappropriate or inadequate, the owner may sue for the damage to the tree alone as if it were severable from the land.[79] In cases focusing on the injury to the trees themselves, courts have admitted evidence of market or use value,[80] replacement cost,[81] loss of productivity,[82] and aesthetic loss.[83] They have often admitted similar evidence in cases where damages were based on loss in value of the underlying land.[84]

C. Valuation Methods

1. Replacement Cost

One of the most used methods for assessing damages for the destruction of fish and wildlife is replacement cost.[85] Commercial breeders or government agencies produce many species of fish and some species of birds and mammals, and the costs of production can be measured to arrive at replacement cost. Moreover, since game farms or government facilities could produce many species not currently bred, it should not be difficult to derive replacement costs for additional species.

More than one-third of the states have indicated that they use replacement cost for determining damages in fish kill cases,[86] and several state legislatures have formally adopted replacement schedules.[87] Many states have based their replacement figures on the prices listed in *Monetary Values of Fish*, a pamphlet published by the American Fishery Society in 1975.[88] The pamphlet lists prices for nearly forty species of fish by both pounds and inches. The Society determined the prices through a survey of commercial hatcheries in the southeastern United States in 1974. Although no similar schedule is yet available for birds or mammals, some agencies have surveyed commercial game breeders in order to derive replacement costs for some species of birds, especially waterfowl.[89]

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[79] C. MCCORMICK, *supra* note 15, at § 126, 22 AM. JUR. 2d *Damages* § 143; Annot., 90 A.L.R.3d 800, 803-04, 812 (1979); Annot., 95 A.L.R.3d 508, 512, 528-29 (1979).

[80] Annot., 90 A.L.R.3d 800, 812 (1979), Annot., 95 A.L.R.3d 508, 528-29 (1979).

[81] Annot., 90 A.L.R.3d 800, 816 (1979), Annot., 95 A.L.R.3d 508, 524-26 (1979).

[82] Annot., 90 A.L.R.3d 800, 815-16 (1979).

[83] *Id.* at 532-33.

[84] *Id.* at 518-20.

[85] For a list of states that use replacement cost, see note 86 *infra*.

[86] Authors' Survey, *supra* note 9. The states are Alabama, Arizona, Arkansas, California, Colorado, Georgia, Hawaii, Idaho, Illinois, Kansas, Kentucky, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nevada, New Hampshire, North Carolina, Ohio, Oklahoma, Oregon, Tennessee, Texas, West Virginia, Wisconsin, and Wyoming.

[87] *Id.* The states are Alaska, Arizona, Florida, Hawaii, Maryland, Michigan, Minnesota, Virginia, and West Virginia.

[88] *Id.* These states include Alabama, Arkansas, Georgia, Kansas, Kentucky, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, North Carolina, Ohio, Oklahoma, Tennessee, Texas, and West Virginia.

The large number of states using replacement cost as a measure of damages is strong evidence of its effectiveness. The principal strengths of this approach are low cost and ease of application. Once states determine a replacement cost for a species, calculating damages becomes a simple matter of multiplying the cost per animal by the number of animals lost.[90] States which use replacement cost have rarely met formal challenges and have frequently been successful in obtaining the full amount sought.

Despite its attractiveness and ease of administration, the use of replacement cost has a significant disadvantage. The method has been used primarily, but not exclusively, for valuation of fish which are, or readily could be, raised in fish hatcheries. The reliability of replacement cost figures will diminish with regard to species that are not bred in captivity and are not generally similar, especially in their breeding habits, to species which are bred. The possibility of a challenge to replacement cost was suggested in a Florida case in which the court gave presumptive, but not conclusive weight to fish schedules developed by the state's Department of Natural Resources.[91] One possible solution to this problem is, as noted above, the establishment of a statutory schedule of replacement costs. This approach, however, suffers from a serious weakness—inflexibility in the face of inflation. The 1975 edition of *Monetary Values of Fish* used 1974 prices, which were 14% higher than 1970 prices. It is unlikely that a statutorily-provided schedule of replacement costs could keep pace with inflation. Therefore, it would probably be preferable for legislation to direct the state fish and wildlife agency to prepare a schedule of replacement costs and to update it periodically.

2. *Liquidated Damages*

States have also used liquidated damages or statutory civil penalties in addition to criminal sanctions for the wrongful taking of wildlife, particularly with respect to game animals.[92] The amount charged is arbitrary, and it generally does not purport to represent any actual "value" of a given species. Until some of the other valuation methods discussed gain manageability and acceptance, this will sometimes be the best available means of recovering damages. Liquidated damages are particularly useful for rare species and large land animals, because replacement costs do not exist for them. Liquidated damages may tend to be lower than actual value, especially for big game animals,[93] and at least one state agency prefers to use them only as a minimum figure for recovery.[94]

III

NEW "ECONOMIC" APPROACHES TO VALUING FISH AND WILDLIFE

A. *Gross Expenditure Method and Travel Zone Approach*

This Article will discuss three economic valuation methods: the gross expenditure method (GEM), the travel zone approach, and the direct consumer's surplus (DCS). Both GEM and the travel zone approach produce valuations for sites from which values for specific resources, such as fish and wildlife, can be derived, while DCS attempts to derive values for the fish and wildlife themselves. GEM and the travel zone approach each have significant problems which suggest that DCS is the preferred approach.

Essentially, the GEM approach attempts to use the amount spent on a recreational experience to measure its value.[95] The calculation includes travel expenses, equipment costs, income foregone, and the like. The computation of gross expenditures for a recreational experience does not, however, measure the net benefits derived from the experience. Whatever the merits of this approach in terms of valuing a specific site or type of recreation,[96] it does not appear that the GEM method will be useful in deriving case-specific values for fish and wildlife.[97] Even so, for pollution incidents with a significant adverse impact on recreation, the state may wish to recover for loss of recreational use, as well as for the fish and wildlife destroyed.

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[89] *Id.* Massachusetts and Texas have used this approach.

[90] Many state agencies that use replacement cost regularly have developed procedures for conducting body counts at the site of a fish kill. *E.g.*, State of Washington, Department of Ecology, Guidelines for Evaluating Fishkill Damages and Computing Fishkill Damage Claims in Washington State 20 (Aug. 1973) (Technical Report No. 72-10); Pollution Committee, American Fisheries Society (Southern Division), Fish Kill Counting Guidelines (1970). For a discussion of some of the problems in conducting a body count of waterfowl, see Comptroller General of the United States, Total Costs Resulting from Two Major Oil Spills 5-6 (June 1, 1977) (letter from Comptroller General to Chairman, Subcommittee on Environment, Energy, and Natural Resources).

It is interesting to note that in 1978, an economist knowledgeable in this area suggested to an audience of professional fish and wildlife biologists that in most cases, the greater variable in determining the actual value of fish and wildlife lost from a pollution incident would result from disagreement over the number of animals killed rather than the price that might be assigned to those animals by different economists. Address by Philip G. Myer, Habitat Protections Advisor, Department of Fisheries and Oceans, Vancouver, British Columbia, at the Joint Annual Conference of the Western Division of the American Fisheries Society (July 12-20, 1978).

[91] Florida Dep't of Pollution Control v. International Paper Co., 329 So. 2d 5, 8 (Fla. 1976) ("Construing the statute to authorize the establish of conclusive evidentiary fish table values would constitute an absolute denial of the right to present evidence on a material issue and would violate constitutional due process of law. Although the manner of determining the value of fish killed may be statutorily established as presumptive or prima facie evidence of a fact, such a statute cannot conclusively prescribe a specific amount of damages for a particular number and species of fish killed").

[92] Two states, South Dakota and Wisconsin, indicated that they use a liquidated damages approach. Authors' Survey, *supra* note 9.

[93] Given the arbitrary nature of liquidated damages, one might expect that the amount of such damages would be higher than the actual loss approximately half the time, and lower than the actual loss the remaining time. This may not be true, however, in the case of liquidated damages for the wrongful taking of fish and wildlife. In this area, poachers and other potential payors may pressure the legislature into setting relatively low amounts for the liquidated damages. Liquidated damages for big game may then become proportionately even lower because of inflation and the increasing rarity of large game animals.

[94] In the Authors' Survey, *supra* note 9, such a preference was indicated by the New Mexico Department of Game and Fish.

Like GEM, the travel zone approach produces a value for a recreation site. This approach, developed by Clawson and Knetsch,[98] is probably the most widely used method for determining recreational values.[99] The distinguishing feature of the travel zone approach is that it assigns the users of a particular recreation site to geographical zones, consisting of concentric rings around the site. The researcher determines the average travel cost and other variable participation expenses for each zone, and then uses this information to construct a demand curve for the site and an estimate of the consumer's surplus.[100] The method assumes that the response of persons in more distant zones to their higher travel costs indicates the reaction that people in closer zones would have to changes in price through increased access or user fees.[101]

Proponents of the travel zone approach disagree on the costs that

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[95] Studies which have used GEM include United States Department of the Interior, United States Fish and Wildlife Service, 1975 National Survey of Hunting, Fishing and Wildlife-Associated Recreation (1977); Environmental Research Group, Georgia State University, Southeastern Economic Survey of Wildlife Recreation (March, 1974); U.S. Army Corps of Engineers and Louisiana Wildlife an Fisheries Commission, Atchafalaya Basin Usage Study: Final Report (1975). These studies derived values based not only on the GEM approach, but also on willingness to sell and to pay, concepts discussed in note 105 *infra*.

[96] *See* Knetsch & Davis, *Comparisons of Methods for Recreational Evaluation*, in Water Research 125, 129 (A. Kneese & S. Smith eds. 1966); Carey, *The Economics of Recreation: Progress and Problems*, 3 W. Econ. J. 169, 178-79 (1965); Crutchfield, *Valuation of Fishery Resources*, 38 Land Econ. 145, 149 (1962).

[97] The GEM method may be appropriate for valuing some extremely rare and endangered species, in which case the total amount expended to preserve and enjoy the few remaining members of the species might be a reasonable measure of the value of the group as a whole, as it is likely that the primary purpose of a trip which includes the habitat of a rare and endangered animal is to see the animal.

[98] M. Clawson & J. Knetsch, Economics of Outdoor Recreation (1966). *See* M. Clawson, Methods of Measuring the Demand for and Value of Outdoor Recreation (Feb. 1959) (Resources for the Future Reprint No. 10).

[99] J. Hammack & G. Brown, *supra* note 12, at 9.

[100] See note 92A *infra*.

[101] For a good, brief description of the technique, see J. Hammack & G. Brown, *supra* note 12, at 9-12. For a fuller explanation, *see* Cesario, *Value of Time in Recreation Benefit Studies*, 52 Land Econ. 32 (1976); M. Clawson & J. Knetsch, *supra* note 98.

should be considered in making the above calculation. Since the object of the exercise is to determine the difference in cost to individuals from different zones, it would be superfluous to include expenses common to all users, such as the cost of their fishing rods. Early studies assumed that characteristics like income and tastes were similar among the populations in various zones,[102] but some adjustment for income differences, if not tastes, seems feasible.

It is essential to note that both the travel zone approach and GEM are site valuation methods. Each method permits a researcher to estimate the total net value of the goods and services provided by a specific site at a specific time. Once an estimate is available, it should be possible to determine the total net value the site would provide if one or more of the resources at the site changed, by introducing a quality variable. An example of a quality variable would be an increase or decrease in the expected rate of success—for instance, the number of fish caught, ducks collected, or birds seen—per visit to the site. Although the gain or loss in net worth would measure the relative change in the value of an activity, rather than the resources themselves, these values should approach the value placed on the fish or wildlife involved.

While with both approaches it should theoretically be possible to derive a value for fish and wildlife at the margin, each method has significant drawbacks. Neither can isolate the value of fish and wildlife; rather, each yields only the aggregate value of the activity in connection with which fish and wildlife are enjoyed. People usually enjoy fish and wildlife while conducting activities, such as backpacking or fishing, which also have a recreational value. While the sighting of a bear or an osprey may enhance the value of such activities, it does not constitute the entire benefit derived from them. Hence the value of the bear or osprey cannot be derived solely from the total amount spent on the recreational activity.

Moreover, neither approach can account for the fact that fish and wildlife enjoyed in the course of a recreational activity provide both public good benefits and private good benefits.[103] Since fish and wildlife are sometimes enjoyed as private goods—as when a duck hunter shoots a duck or a fisherman catches a fish—and sometimes enjoyed as public or collective goods—as when birdwatchers practice their hobby—an accurate method for valuing fish and wildlife must be able to separate and account for the mixed nature, partly private and partly public, of wildlife. It is worth noting that placing a relatively small value on a unit of a collective or public good may nevertheless generate very large aggregate values because the consumption of the unit by one person does not preclude the consumption of the same unit by a large number of other people.

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[102] *See* J. Hammack & G. Brown, *supra* note 2, at 9.

[103] Samuelson developed this concept of private goods and public goods in a trilogy of articles. Samuelson, *The Pure Theory of Public Expenditure*, 36 Rev. Econ. & Statistics 387 (1954); Samuelson, *Diagrammatic Exposition of a Theory of Public Expenditure*, 37 Rev. Econ. & Statistics 350 (1955); Samuelson, *Aspects of Public Expenditure Theories*, 40 Rev. Econ. & Statistics 352 (1958). As Samuelson explains, a commodity is a private good in economic terms if, when it is consumed by one person, it is no longer available to be consumed by another person. Given a set quantity of any private good, the more units of the good that one person consumes, the fewer are the units available to others. At the other end of the spectrum are public or collective goods, which can be consumed by one person without diminishing the number of units which other persons can consume. The standard example of a public or collective good is national defense. Not only does one person's "consumption" of national defense not diminish another person's, but the addition of more

Additionally, neither method can include any estimate of the existence of "option values" of fish and wildlife. These are the values which accrue to some people from merely knowing that fish and wildlife exist and are available for more direct enjoyment now or in the future. Another serious theoretical problem with both methods is that they produce, at best, an estimate of the value of the resources available only at a specified site. If the resource use at this site is not consumptive, the value derived will usually be inadequate because the fish and wildlife, which are generally mobile, may also provide some value at another site at another time. Finally, a more practical limitation upon the travel zone approach is the potential difficulty of obtaining the necessary travel cost data. Where access to a site is limited and controlled, this problem may not be overwhelming, but in other cases the data may be unobtainable.

Despite all these problems, there are advantages to both GEM and the travel zone approach. Use of GEM could be particularly feasible because at least one court has already recognized the validity of recreational studies for purposes of land use planning,[106] and the concept of recreational value is thus not entirely new to American jurisprudence. The travel zone approach, on the other hand, appears to have significant potential so that with further work and refinements, it may produce usable, though probably understated, estimates of the value of various species of fish and wildlife.

B. The Direct Consumer's Surplus Approach

The newest and most promising approach to the problem of valuing fish and wildlife is the direct consumer's surplus (DCS) approach. With this method, researchers simply ask individuals, through personal

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individuals to the national population does not reduce the amount of national defense that existing citizens "consume." Samuelson, *The Pure Theory of Public Expenditure*, 36 Rev. Econ. & Statistics, 387, 387 (1954); Samuelson, *Diagrammatic Exposition of a Theory of Public Expenditure*, 37 Rev. Econ. & Statistics 350, 350 (1955).

[106] *E.g.*, State ex rel. Baxley v. United States Corps of Engineers, 411 F. Supp. 1261 (N.D. Ala. 1976) (stream channelization).

interviews or mail questionnaires, to provide estimates of the surplus value they obtain from fish and wildlife.[105]

Of the various methods for eliciting contingent value information, the iterative bidding technique developed by Randall and Brookshire appears to be the most flexible and promising.[106] The technique requires respondents to indicate whether they are willing to pay a certain price for a good or service, rather than going without it or some units of it. The researcher varies the price until it is possible to identify the point at which the respondent indicates indifference. Unlike the travel zone method or GEM, this technique can include estimates of option value, as some respondents will include in their valuations the potential for future enjoyment of the fish and wildlife.

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[105] As developed by J.R. Hicks in *the Four Consumer's Surpluses*, 11 Rev. Econ. Stud. 31 (1943), consumer's surplus is the difference between the price that consumers pay for the goods and services they purchase and the value to them of those goods and services. Hammack and Brown define consumer's surplus as "a measure of net benefits—benefits above costs paid—received by an individual from some good or service purchased." J. Hammack & G. Brown, *supra* note 12, at 4-5. Economists have used only two of the four consumer's surpluses identified by Hicks, "willingness to pay" and "willingness to sell [or accept]," to derive values for fish and wildlife. *See* Currie, Murray & Schmitz, *The Concept of Economic Surplus and Its Use in Economic Analysis*, 81 Econ. J. 741 (1971); Willig, *Consumer's Surplus Without Apology*, 66 Am. Econ. Rev. 589 (1976). As Mäler and Wyzga explain,

> *The compensating variation* is defined as the least amount of money necessary to compensate a consumer for a change from the present situation to some other situation. For example, if the new situation is characterised by a higher price of a commodity the compensating variation is the amount we have to give to the individual so that he does not feel worse off in the new situation. . . .
>
> If the price of a good falls, the compensating variation is defined in exactly the same way, except that it is negative. It tells us how much we can confiscate from the individual without leaving him in a worse situation than in the original situation.
>
> The *equivalent variation* is defined as the amount of transfer in money income that the individual regards as equivalent to the change from the original situation to the new one. If, for example, the price of a good has increased, we could ask: by what quantity can we reduce the income of the individual instead of raising the price of the good so that the individual is indifferent to these two changes? If the price has fallen, we could similarly ask by what quantity must we increase the income of the individual instead of decreasing the price so that he is indifferent between the increase in income and the fall in price? The necessary changes in income in these two cases is the equivalent variation.

K. Mäler & R. Wyzga, *supra* note 18, at 31-32.

The difference between the two measures lies in their perspectives. Essentially, the compensating variation takes the initial situation (pre-existing equilibrium) as its starting point and measures the amount of income which an individual must receive or give up in order to be as well off after some change in the initial situation as he was before the change. The equivalent variation takes the final situation (the new equilibrium) as its starting point and measures the amount by which the change from the initial situation to the final situation has reduced or improved an individual's welfare.

While it might appear that the compensating variation and the equivalent variation could be used interchangeably, Hammack and Braun have pointed out that the existing legal rights of the parties involved, as well as tradition and custom, will result in one or the other of these two measures being suited to the analysis of any particular problems or situation. *See* J. Hammack & G. Braun, *supra* note 72, at 7. For example, if one is trying to decide whether to grant a license to a private mining company to strip mine a portion of a national park, willingness to sell or accept, the equivalent variation, is the appropriate measure. If, on the other hand, one wants to determine how much should be spent to reclaim land which has already been strip-mined, then willingness to pay, the compensating variation, is the appropriate measure. Because this Article concerns the determination of the amount of damages which has resulted from the wrongful destruction of fish and wildlife resources, the compensating variation is the appropriate measure of damage as it recognizes the situation which existed before a particular pollution incident as the legitimate situation and measures the amount injured parties must receive in order to be as well off after the incident as they were before it.

Although a complete description of the iterative bidding technique is beyond the scope of this Article, some of the potential problems and limitations of this method and other contingent valuation processes should be noted. The key to the success of the DCS approach appears to lie in the quality of the questionnaire.[107] The use of questionnaires is fundamental to the collection of data on which persons of reasonable intelligence rely in the modern world to make important decisions, and this Article will therefore not concern itself with potential inaccuracies of self-reporting by individuals.[108] A more serious question is whether the questions asked and answers given are reliable. In other words, objections to the DCS approach relate to how well a particular questionnaire survey conforms to the requirements of economic theory and to the standards of social science for the collection of reliable data.[109]

The two most likely objections to the DCS technique are that the questions asked, and hence the answers to them, are necessarily hypothetical, and that some respondents will exaggerate their answers in a deliberate attempt to influence or "strategically bias" the outcome of the survey. As to the first concern, social scientists and psychologists have found that the hypothetical nature of questionnaires is not a serious problem because individuals tend to respond sincerely and accurately to surveys that provide an adequate context for consideration of questions.[110] Researchers should describe the goods to be valued fully and consistently as to quantity, quality, location, time, and available additional units, so that all respondents will have as uniform an understanding of the problem as possible. The questionnaire should portray the hypothetical market in reasonable institutional detail and should specify a realistic mechanism for charging for the goods, such as a user fee, a license fee, or the imposition of some sort of sales or excise tax. The payment vehicle chosen should be feasible, relevant to the product or service being valued, and as familiar as possible to the respondents.

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[106] A. Randall & D. Brookshire, Public Policy, Public Goods, and Contingent Valuation Mechanisms (1968) (Department of Agriculture, Staff Paper No. 68).

[107] *See id.* at 10-15.

[108] *Id.* at 10.

[109] *Id.*

[110] *Id.* at 15-16.

The researcher should try to convince respondents that all users of the product or service will be required to pay equally for it. The questionnaire should avoid questions likely to generate protest votes, and should attempt to eliminate various biases relating to the starting point price, the payment mechanism, and the information provided. These precautions should help to ensure that the stated intentions of a respondent will correspond with the respondent's actual behavior. Fortunately, the problem of contextual conformity does not appear severe in valuing fish and wildlife because the hypothetical action at issue—paying a somewhat higher price for a product—is something which the respondent can do in a realistic time, place, and manner.

The problem of strategic bias presents somewhat different concerns. Strategic bias may occur when a respondent strongly desires or opposes a change in the existing situation, or believes that the value the respondent places on a publicly-supplied good such as clean air or fish and wildlife, differs significantly from the value placed on it by the average member of society. In such a situation, the respondents who behave strategically will exaggerate the difference between their estimation of value and the societal mean. Respondents who think they place a lower value on the good than the societal mean will understate the price they are willing to pay in order to reduce the tax payment they anticipate having to make to cover the cost of the good; those who think they place a higher value on the good than the societal mean will overstate the price they are willing to pay in order to increase the supply or production of the good.[111]

The possibility of this kind of strategic bias should not pose a serious problem for DCS valuations of fish and wildlife. First, the researcher should be able to identify any responses that are clearly out of line and treat them accordingly. Moreover, the time, information, and computations necessary to design a successful strategy that would not be apparent to the researcher and yet would affect the survey's results are likely to serve as a major disincentive for attempting such a ploy, especially since the chances that one individual could significantly bias the results are very small.[112] Finally, even when strategic behavior is possible, it does not appear to be common.[113]

In spite of these difficulties with the DCS approach, it appears that the method, as refined by Randall and Brookshire, is ready for application. Its application will, however, be expensive. Researchers must design and test a survey questionnaire, and this may prove especially time-consuming and costly because the DCS approach is just emerging from the developmental stage. Sending out the questionnaires and processing and analyzing the responses will also be time-consuming. Since this procedure has not, to the best of the authors' knowledge, been employed directly in litigation, anyone planning to rely on it for proving compensatory damages must be prepared to explain and vigorously defend the methodology. This will require the supporting testimony of expert witnesses other than the economist who actually designed and conducted the survey. In light of the above considerations, it will probably be advisable to use DCS and other economic approaches only in cases where there have been extensive losses of wildlife with long-term impacts, while relying on periodically updated replacement or economic valuation schedules for smaller losses.

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[111] P. Sorenson, Environmental Damage in Economics and in Law: The Case of the Santa Barbara Oil Spill 11 (Nov. 19, 1976) (paper delivered at the annual meeting of the Southern Economics Association, Atlanta, Georgia).

[112] A. Randall & D. Brookshire, *supra* note 106, at 15-17.

[113] *Id.* at 17.

Even though there are costs and problems inherent in the DCS approach, this method appears to be, at least in theory, the best economic approach to the problem of valuing fish and wildlife. Whether it ultimately proves useful in litigation will depend, in part, upon whether the approach is as viable as it now appears and in part on the skill and preparation of those who use it. The "hypothetical" or "contingent" nature of the process, which permits it directly to attack the problems created by the absence of a "real" market, is its greatest strength from the point of view of the economist, but will no doubt trouble some judges and constitute its principal legal weakness, at least until the process has won acceptance in a few cases.

IV
RECOMMENDATIONS

Given the uncertainty of the law with respect to both the right of the state to seek compensation under common law and the means of establishing monetary values for fish and wildlife losses, the authors believe that legislation is desirable. A proposed model statute appears in Appendix I. The legislation should, at a minimum, recognize the interest of the state in fish and wildlife within its boundaries,[114] and authorize an appropriate state officer or agency to bring actions for the recovery of full and adequate compensation for fish and wildlife losses.[115] Since replacement cost will often be the easiest and in some cases the most appropriate measure of damages, the legislation should direct the fish and wildlife agency to develop and maintain current schedules of the cost of replacing species for which replacement is possible.[116] In addition to replacement of the actual loss, legislators may

wish to consider the wisdom of expressly authorizing recoveries for the necessary expense of returning reduced populations to their previous numbers as rapidly as possible. This would include factors such as the need for sufficient replacements to account for mortality within the replacement stock;[117] restoration of habitat;[118] and allowance for secondary losses where the impairment of brood or feed stock may affect other species.[119]

The legislation should not limit recovery to replacement cost, since such an approach would be either inadequate or unavailable in some cases. The legislation should therefore expressly recognize and authorize the use of "economic" valuation methods as well,[120] since some courts may otherwise be reluctant to permit recovery based on an economic measure of damages. In order to account for the loss of fish and wildlife for which there is no feasible method of assigning a reliable monetary value, the legislation should also establish a schedule of liquidated damages which will serve as a minimum measure of damages for important species of fish and wildlife for which replacement costs are unavailable.[121]

The legislation should be liberal with respect to the parties and the valuation techniques that can be used to establish monetary values. Thus in addition to granting the appropriate state official or agency flexibility to develop the approaches that will most accurately reflect the value of the fish and wildlife, the legislation should authorize private citizens to initiate or intervene in actions to recover compensatory damages,[122] and should authorize the payment of expenses reasonably incurred where these efforts are successful in either obtaining or increasing the amount of recovery.[123] Regardless of which valuation method the state agency or private citizen uses in a particular action, the legislation should also authorize the agency to pay for the costs of clean-up and investigation, and to collect those expenses from the persons responsible.[124]

CONCLUSION

The loss of substantial numbers of fish and wildlife from pollution caused by commercial and industrial activity has become an unfortunate fact of life. Commercial and industrial activities are necessary, but this does not mean that the public at large should pay all the resulting costs of the destruction of fish and wildlife. Requiring parties responsible for fish and wildlife losses to compensate the public will increase public welfare and economic efficiency.

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[114] *See, e.g.*, Model Act, Preamble, Appendix I *infra*.

[115] *Id.* ¶ 4(2).

[116] *Id.* ¶ 5.

[117] *Id.* ¶ 7(b).

[118] *Id.* ¶ 6.

[119] *Id.* ¶ 7(c).

[120] *Id.* ¶ 7(a).

[121] *Id.* ¶¶ 6 & 13.

[122] *Id.* ¶ 8.

[123] *Id.* ¶¶ 9 & 10.

[124] This article has focused on actions by states to recover damages for the loss of fish and wildlife under their jurisdiction. For a discussion of a possible federal regulating scheme, see Du Bey and Fidell, *The Assessment of Pollution Damage to Aquatic Resources: Alternatives to the Trial Model*, 19 SANTA CLARA L. REV. 641 (1979).

Legal remedies are available through legislation and, in many cases, through state common law as well. The problem of determining the value of fish and wildlife has been a major factor in discouraging recoveries. As this Article has noted, methods for valuing these resources are available. Some, like replacement cost, are well established. Newer methods for more difficult valuation problems are just developing and have not yet received much application. Specific authorizing legislation will facilitate state recovery efforts by establishing a sound legal basis and providing a framework for the development and use of a variety of valuation methods. The growing number of state actions and the statutory mandate of Superfund should lead to rapid progress in this area.

APPENDIX I

A BILL

To recognize the value and importance of fish and wildlife to the people of this State and to provide for the recovery by this State of full and adequate damages for the loss of its fish and wildlife as a result of the unlawful pollution of its air, land, or waters, or the direct unauthorized-taking or destruction of its fish and wildlife.

Be it enacted by the Legislature of the State of __________ that:

Statement of Findings

1. The State of __________, in its sovereign capacity, is the guardian and trustee of the natural resources of this State including its fish and wildlife; and

2. This State has not in the past fully recognized its right and obligation to protect its fish and wildlife resources through the recovery of full and adequate compensation for loss of its fish and wildlife as a result of the unlawful pollution of its air, land, or waters, or the unauthorized taking of its fish and wildlife.

Definitions

3(a) *[Commissioner, Director, or Commission]* is the [state agency or official] authorized and directed to develop schedules and methods for the valuation of fish and wildlife and to seek recovery for the injury thereto under this Act.

(b) *Person* includes any natural person, corporation, firm, company, partnership, joint stock company, foundation, society, association, labor organization, Indian tribe, municipality, or county existing under the laws of this State.

(c) *Unlawful pollution* means the discharge or release into the environment of any substance, including radiation and heated or cooled water, in violation of any law limiting, regulating, or prohibiting the discharge or release of such substance into or on the air, land, or waters of this State, or the intentional or negligent discharge or release of any substance which the person discharging or releasing it knows or in the exercise of reasonable caution ought to know could injure or destroy any of the fish and wildlife of this State.

(d) *Fish and wildlife* means any member of the animal kingdom, including without limitation any mammal, fish, bird, insect, amphibian, reptile, mollusk, crustacean, arthropod, or other invertebrate as well as any part, product, egg or offspring thereof.

(e) *Unauthorized taking* means the killing, capturing, collecting or destroying of any fish or wildlife other than any lawful recreational or commercial fishing, hunting, or trapping.

Development of Valuation Methods and Initiation of Actions

4. The [Commissioner, Director, or Commission] shall: (1) to the fullest extent possible, develop reasonable methods for assessing the monetary value of fish and wildlife within this State, and shall promulgate such methods in accordance with [the applicable rulemaking provisions of the state's Administrative Procedures Act]; and (2) with the assistance of the Attorney General, initiate such actions as the [Commissioner, Director, or Commission] believes are justified to recover full and adequate compensation for the loss of any fish or wildlife of this State as a result of any unlawful pollution of the air, land, or water of this State or of the direct unauthorized taking of fish or wildlife of this State.

5. In furtherance of the authority and direction set out in Paragraph 4, the [Commissioner, Director, or Commission] shall, to the fullest extent possible, develop and promulgate and, from time to time, review, revise, and repromulgate schedules of the current cost of replacing various fish and wildlife species, in accordance with [the applicable rule-making provisions of the state's Administrative Procedures Act].

Recoverable Damages

6. The replacement costs set out in the schedules provided for in Paragraph 5 or, if no replacement cost has been so established, the stip-

ulated value, if any, set out in Paragraph 13 of this Act shall constitute the minimum compensation which the State shall be entitled to recover for fish and wildlife covered by a schedule. In addition to replacement cost, the State shall be entitled to recover such additional damages as it can establish with reasonable certainty, including but not limited to the loss of recreational opportunities and aesthetic values of the fish and wildlife lost. In the event that neither a replacement cost under Paragraph 5 or a stipulated value under Paragraph 13 has been established for a species of fish or wildlife which has been taken in an unauthorized taking, the State shall be entitled to recover such damages as it can establish with reasonable certainty.

7. In determining the extent or number of fish and wildlife lost as a result of some intentional, negligent, or unlawful pollution, recovery by the State of the amounts recoverable under Paragraph 6 shall not be limited to the number of animals actually counted or collected, but may be based upon estimates, made upon sound scientific principles, of:

a. the number of fish or wildlife actually killed or lost, or
b. the mortality of replacement stock, or
c. the loss or impairment of productivity which may have also resulted.

Citizen Suit

8. In order to assure prompt and vigorous prosecution of claims for compensation for fish and wildlife losses and to encourage the development and utilization of a variety of methods for the valuation of fish and wildlife losses, any person may initiate an action, after thirty days notice to the [Commissioner, Director, or Commission], or may intervene in an on-going action, for the recovery of compensation for fish and wildlife lost as a result of unlawful pollution or the direct unauthorized taking of fish or wildlife of this State.

Application of Monies Recovered

9(a) Except as provided in Paragraph 9(b) below, all damages recovered in a suit brought pursuant to this Act shall be used by this State for the protection and management of its fish and wildlife.

(b) In the event that the [Commissioner, Director, or Commission] does not participate in a successful action initiated by a person pursuant to Paragraph 8 of this Act, or that a person who intervenes in an action to recover damages for fish and wildlife resources brought pursuant to Paragraph 4 of this Act is able successfully to secure for the State a recovery based on a higher value for the fish and wildlife losses than the [Commissioner, Director, or Commission] had otherwise established or sought to establish, that person shall be entitled to receive

from the final award reimbursement all expenses reasonably incurred in the prosecution of the action, including attorneys' fees, expert witness's fees, and court costs.

10. In the event that the parties to an action to recover damages for fish and wildlife losses brought pursuant to Paragraph 4 or 8 of this Act agree to a settlement of the action, the [Commission, Director, or Commission] may reimburse a person participating in the action pursuant to Paragraph 8 of this Act for all or any portion of the expenses reasonably incurred in the prosecution of the action, including attorneys' fees, expert witness's fees, and court costs, to the extent that the [Commissioner, Director, or Commission] believes that the person helped to establish a higher value for the fish or wildlife than would otherwise have been established or otherwise materially contributed to the settlement of the action.

11. Damages recovered in an action brought to recover for the loss of fish and wildlife pursuant to this Act, less experts' fees reasonably incurred in the prosecution of the action and such costs, if any, as are awarded to a private citizen pursuant to Paragraph 9 or 10 of this Act, shall be applied by the [Commissioner, Director, or Commission] to the replacement of the fish or wildlife lost, or if that is not feasible, to the propagation and protection of fish and wildlife and the acquisition, management, and protection of fish and wildlife habitat within the State.

Research Fund

12. The [Commissioner, Director, or Commission] shall establish a fund of not more than $_____ for the purpose of conducting such surveys and investigations as may be necessary to establish with reasonable certainty the extent and value of any fish or wildlife lost as a result of any unlawful pollution of the air, land, or waters of this State or its fish and wildlife, or the unauthorized taking of the fish and wildlife of this State.

Stipulated Damages

13. In recognition of the fact that replacement costs cannot at the present time be determined for some species of fish and wildlife, the following values are hereby established for individual members of the species listed below until such time as the [Commissioner, Director, or Commission] establishes a replacement cost therefor under Paragraph 2 of this Act:

(a)	Haliaeetus leucocephalus (Bald Eagle)	$5,000
(b)	Pandion haliaetus (osprey)	$5,000
(c)	Megaceryle alcyon (Belted kingfisher)	$ 50
(d)	Acipenser oxyrhynchus (Atlantic Sturgeon)	$2,500

(e)	Gulo luscus (Wolverine)	$ 500
(f)	Oreamnos Americanus (mountain goat)	$2,500
(g)		
(h)		
etc.		

Effect on Other Laws

14. The recoveries provided for by this Act are in addition to, not in derogation of, other recoveries, fines, or penalties authorized by any other statute or rule of law.

Appendix II

State Survey
Recovery for Destruction of
Fish & Wildlife

1. Does your state have legislation authorizing any of its agencies to recover damages for the destruction of fish and/or wildlife resources as a result of pollution?

yes _____ no _____

If "yes" please cite the statute or, if possible, attach a copy.

____

2. Does your state have legislation setting up civil or criminal penalties for the wrongful taking of fish and/or wildlife?

yes _____ no _____

If "yes" please provide citation.

____

3. Do you utilize replacement costs to measure damages?

yes _____ no _____

If you use any other method in conjunction with or in place of replacement costs please identify the method briefly.

____

____

____

If you use replacement costs, what source do you use?

____ a) *Monetary Value of Fish* published by the American Fisheries Society.

____ b) Statutory schedule.

____ c) Regulatory schedule.

____ d) *ad hoc* survey.

e) Other, please describe.

____

____

4. Approximately how often has your state taken action administrative or judicial to recover for the destruction of its fish and wildlife resource? ____

What percentage of these actions have resulted in a recovery?

____

Have any of these cases gone to trial on the issue of

____ a) right to recover.

____ b) the method of computing or amount of the damages sought.

If "yes" please provide citation.

____

5. To your knowledge are there any cases now pending before a court or an administrative agency to recover damages for the destruction of fish and wildlife resources? ______________________________

If there are please identify the case and the person or persons in charge of it.

____

____

____

NATIONAL WILDLIFE FEDERATION
1412 Sixteenth Street, N.W., Washington, D.C. 20036 202—797-6800

EXHIBIT II

July 12, 1982

The Honorable James G. Watt, Secretary
Department of the Interior
C Street, Between 18th and 19th Streets, N.W.
Washington, D. C. 20240

Dear Mr. Secretary:

The National Wildlife Federation is extremely distressed over the Interior Department's failure to aggressively pursue its legal responsibility to develop regulations for the assessment of natural resources damages under Superfund. As you know, the Comprehensive Response, Compensation, and Liability Act of 1980 ("Superfund") set a two-year deadline for promulgation of these regulations. That deadline is December 11, 1982. The Superfund Executive Order (No. 12316, August 14, 1981) assigned responsibility for developing these regulations to the Department of the Interior.

We are alarmed and disappointed to discover that, with the statutory deadline barely half a year away, there is no evidence that the rule-making task has even begun.

This shocking lack of action by the Interior Department means that injury to natural resources resulting from releases of hazardous wastes and oil will go largely unredressed as Federal and State agencies pursue the clean-up of inactive hazardous waste dumps. It also means that those entrusted with safeguarding natural resources from such harm will be compelled to individually and repetitively go through the laborious task of quantifying the injury to such resources. The inevitable consequences will be inadequate protection of the nation's natural resources--contrary to the will of Congress and the American people as expressed in Superfund, and the inefficient and counterproductive allocation of funds and manpower by natural resource trustees at the Federal and State level.

The National Wildlife Federation, on behalf of its millions of members and supporters, cannot stand mute while the Interior Department allows Superfund's natural resource protections to atrophy from disuse. Interior's legal mandate to expeditiously develop natural resource damage assessment regulations must be adhered to. Accordingly, we respectfully request the following information at your earliest convenience:

1) The current status of Interior's implementation of Superfund's mandate to promulgate natural resource damage assessment regulations by December 11, 1982 (identify all relevant tasks completed to date).

2) Interior's best estimate of when proposed and final damage assessment regulations will be promulgated (include all intermediate milestones).

3) Interior's best estimate of the administrative costs associated with developing these regulations and identification of the budget resources, if any, that have been set aside to defray these costs.

4) Interior's best estimate of the manpower needs associated with developing these regulations and identification of the staff positions or personnel, if any, that have been designated to meet these needs.

5) To the extent lack of budget or manpower resources is asserted as contributing to the lack of progress in developing damage assessment regulations, documentation of the steps Interior has taken, if any, to obtain the needed resources through OMB, the U. S. Congress, or the EPA budget task force established pursuant to the Superfund Executive Order.

If there are any questions concerning this request, please feel free to contact Ken Kamlet of my staff (797-2945).

Sincerely,

Jay D. Hair
JAY D. HAIR
Executive Vice President

cc: Attached List

JDH/kk

cc: G. Ray Arnett, Assistant Secretary for
Fish, Wildlife, and Parks
Bruce Blanchard, Director,
Office of Environmental Project Review
Robert A. Jantzen, Director,
U.S. Fish and Wildlife Service
Boyden C. Gray, Esquire,
Legal Counsel to the Vice President
Carol Dinkins, Esquire,
Assistant Attorney General for Land and Natural Resources
David Stockman, Director,
Office of Management and Budget
Senator John H. Chafee, Chairman,
Subcommittee on Environmental Pollution, Committee on
Environment and Public Works
Rep. James J. Florio, Chairman
Subcommittee on Commerce, Transportation and Tourism,
Committee on Energy and Commerce

TESTIMONY OF THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION BEFORE THE SENATE ENVIRONMENT AND PUBLIC WORKS COMMITTEE - SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION

AUGUST 4, 1982

PRESENTED BY GEORGE J. TYLER
ASSISTANT COMMISSIONER FOR
ENVIRONMENTAL MANAGEMENT
AND CONTROL

SENATOR CHAFEE, MEMBERS OF THE COMMITTEE, I WANT TO THANK YOU FOR THE OPPORTUNITY TO PRESENT NEW JERSEY'S OBSERVATIONS CONCERNING THE IMPLEMENTATION OF THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT OF 1981, COMMONLY REFERRED TO AS SUPERFUND, AND TO SHARE WITH YOU SOME SUGGESTIONS WHICH, I THINK, WILL ELIMINATE SOME OF THE PROBLEMS THAT WE CAN OTHERWISE EXPECT TO ENCOUNTER DURING THE CONTINUED IMPLEMENTATION OF THIS ENORMOUSLY IMPORTANT ENVIRONMENTAL PROGRAM.

SUPERFUND OVERVIEW AND PAST EXPERIENCE

BEFORE DISCUSSING MORE RECENT DEVELOPMENTS OF THE SUPERFUND PROGRAM, I THINK IT BENEFICIAL TO REVIEW SOME OF THE BASIC PROBLEMS THE LEGISLATION WAS ORIGINALLY DESIGNED TO AMELIORATE. THE SUPERFUND LAW IS THE RESULT OF YEARS OF DISCUSSION, NEGOTIATION AND DEBATE, INVOLVING FEDERAL, STATE AND MUNICIPAL ENVIRONMENTAL AGENCIES, THE PETRO-CHEMICAL INDUSTRY AND CONCERNED GROUPS OF PRIVATE CITIZENS, WHO WERE INTENT UPON PROVIDING A SOLUTION TO ONE OF THE GREATEST HAZARDS THREATENING THE LAND AND WATER RESOURCES OF OUR NATION - THE ILLEGAL DISCHARGE OF HAZARDOUS SUBSTANCES. THE MAJOR COMPONENT OF THIS SOLUTION WAS TO ESTABLISH AN INDEPENDENT FEDERAL FUNDING SOURCE THAT WOULD BE AVAILABLE TO FURNISH MONIES TO PAY FOR THE CLEAN-UP OF DISCHARGES. DUE TO THE MAGNITUDE OF THIS PROBLEM, THE FRAMERS OF THIS LEGISLATION FORESAW AN OPPORTUNITY

TO DEVELOP A COOPERATIVE PROGRAM WHICH WOULD UTILIZE THE TECHNICAL AND FINANCIAL RESOURCES OF FEDERAL GOVERNMENT AND THE AFFECTED STATE WHENEVER SUPERFUND MONIES WERE TO BE USED TO AMELIORATE A DISCHARGE. FINALLY, WHILE SUPERFUND CLEARLY PROVIDES FOR THE CLEAN-UP OF CURRENT DISCHARGES, IT WAS UNDERSTOOD THAT THE MAJOR FOCUS OF THE PROGRAM WOULD BE TO PROVIDE FOR THE CLEAN-UP OF SITES WHERE HAZARDOUS WASTE HAD BEEN DEPOSITED IN THE PAST CAUSING THE POTENTIAL DISCHARGE OF HAZARDOUS SUBSTANCES. IN ORDER TO EFFECTIVELY APPORTION SUPERFUND'S LIMITED DOLLARS, THE ACT DIRECTED THE PRESIDENT TO ESTABLISH A PRIORITY LIST OF THE MOST HAZARDOUS SITES THROUGHOUT THE NATION.

NEW JERSEY, THE STATE WHICH RANKS THIRD IN THE NATION IN INDUSTRIAL CHEMICAL OUTPUT, WAS AMONG THE FIRST TO REALIZE THE NEED FOR THIS TYPE OF LEGISLATION. NEW JERSEY ESTABLISHED ITS OWN FORM OF SUPERFUND, THE NEW JERSEY SPILL COMPENSATION AND CONTROL ACT OF 1977. THEREFORE, WHEN FEDERAL LEGISLATION IN THIS AREA WAS PASSED IN 1980, NEW JERSEY WAS FULLY PREPARED TO COOPERATE WITH THE FEDERAL GOVERNMENT IN ITS EXPEDITED IMPLEMENTATION. THE SPILL COMPENSATION FUND, NEW JERSEY'S PRIMARY FUNDING SOURCE FOR THE STATE'S COST SHARE OF ANY REMEDIAL ACTION HAD ALREADY BEEN ESTABLISHED. MOREOVER, PROGRAMS WITHIN THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION WERE UPGRADED TO A DIVISIONAL LEVEL TO PROVIDE

THE NECESSARY TECHNICAL EXPERTISE AND MANPOWER TO FULFILL THE STATE'S COOPERATIVE MANAGEMENT ROLE IN SUPERFUND CLEAN-UPS. WE WERE ALSO ONE OF THE FIRST STATES IN THE NATION TO PROVIDE THE FEDERAL GOVERNMENT WITH A LIST AND DETAILED EXAMINATION OF SITES IN OUR STATE WHICH WE BELIEVED TO BE IN DESPERATE NEED OF SUPERFUND ACTION.

THIS BRINGS US TO THE CENTRAL QUESTION BEFORE US THIS MORNING. WHY, TWO YEARS AFTER ITS ENACTMENT, HAS THE FEDERAL GOVERNMENT FAILED TO SUBSTANTIALLY IMPLEMENT THE MAJOR COMPONENT OF SUPERFUND BY GETTING ACTUAL CLEAN-UPS UNDERWAY?

FIRST OF ALL, WHILE I THINK ALL PARTIES WOULD AGREE THAT THIS NEW PROGRAM HAS HAD ITS DIFFICULTIES IN GETTING STARTED, DIFFICULTIES THAT I WILL DISCUSS SHORTLY, I BELIEVE IT IS IMPORTANT TO NOTE THAT SUBSTANTIAL PROGRESS HAS BEEN MADE TOWARDS THE IMPLEMENTATION OF REMEDIAL ACTIONS UNDER THE ACT. IN REGARD TO NEW JERSEY, ON MAY 12 OF THIS YEAR, OUR DEPARTMENT AND THE USEPA EXECUTED AGREEMENTS WHICH WILL PROVIDE FOR THE CLEAN-UP OF THE HIGHEST RANKING NEW JERSEY SITE ON THE FEDERAL INTERIM REMEDIAL PRIORITY LIST - THE PRICE LANDFILL IN ATLANTIC COUNTY, NEW JERSEY. ADDITIONALLY, WE HAVE RECENTLY EXECUTED SIMILAR AGREEMENTS ON TWO OTHER NEW JERSEY SITES - THE LONE PINE AND THE KIN-BUC LANDFILLS. WORK HAS BEGUN WITH REGARD TO THE PRICE LANDFILL AGREEMENTS AND SHOULD BEGIN AT THE OTHER SITES SHORTLY.

OF COURSE, THE QUESTION THEN BECOMES: "WHY WEREN'T THESE OPERATIONS BEGUN MONTHS, IF NOT YEARS AGO"? I AM CERTAINLY NOT HERE TODAY AS AN APOLOGIST FOR THE PRESENT ADMINISTRATION. SURELY, MEASURES COULD HAVE BEEN TAKEN BY THE FEDERAL EXECUTIVE AGENCIES INVOLVED TO IMPLEMENT THIS PROGRAM WITH GREATER DELIBERATION AND SPEED. THE STATE OF NEW JERSEY IS ALREADY ON RECORD ON THIS ISSUE THROUGH SEVERAL LEGAL ACTIONS WHICH WE BELIEVED WERE NECESSARY TO THE MOVEMENT OF THIS PROGRAM. HOWEVER, I THINK IT WILL BE MUCH MORE PROFITABLE AT THIS JUNCTURE TO DISCUSS CURRENT PROBLEMS AND THEIR SOLUTIONS RATHER THAN REHASH PAST MISTAKES WHICH ARE NO LONGER RELEVANT TO THE CONTINUED IMPLEMENTATION OF THE ACT. OUR REAL PURPOSE HERE TODAY IS NOT TO ASSESS RESPONSIBILITY FOR PAST MISTAKES, BUT TO ESTABLISH MEASURES TO ASSURE THAT ANY PRESENT OR FUTURE PROBLEMS ARE REMOVED BEFORE THEY BECOME SERIOUS ROADBLOCKS TO CONTINUED IMPLEMENTATION.

PROBLEM AREAS AND SUGGESTED SOLUTIONS

SOME OF THE PAST PROBLEMS IN IMPLEMENTING SUPERFUND FLOW FROM AMBIGUITY IN THE LANGUAGE OF THE ACT ITSELF. PERHAPS ONE OF THE MOST FUNDAMENTAL EXAMPLES OF THIS PROBLEM THAT I CAN PROVIDE CONCERNS THE LANGUAGE OF SECTION 114 OF THE ACT:

> "EXCEPT AS PROVED IN THIS ACT, NO PERSON MAY BE REQUIRED TO CONTRIBUTE TO ANY FUND, THE PURPOSE OF WHICH IS TO PAY COMPENSATION FOR CLAIMS FOR ANY COSTS OF RESPONSE OR DAMAGES OR CLAIMS WHICH MAY BE COMPENSATED UNDER THIS TITLE".

THIS SENTENCE, PHRASED AS IT IS, HAS BEEN THE SUBJECT OF NO LESS THAN THREE (3) SEPARATE STATE AND FEDERAL COURT ACTIONS. THESE ACTIONS HAVE REQUIRED THE RESPONSIBLE STATE AND FEDERAL AGENCIES TO CONCENTRATE THEIR LIMITED TECHNICAL AND LEGAL RESOURCES TOWARDS THE PREPARATION OF LITIGATION RATHER THAN TOWARD THE NEGOTIATION OF SUPERFUND AGREEMENTS AND THE IMPLEMENTATION OF CLEAN-UPS.

OTHER AREAS OF THE LAW POSE SUBSTANTIAL PROBLEMS TO BOTH THE STATE AND FEDERAL GOVERNMENTS AS AGREEMENTS ARE NEGOTIATED FOR REMEDIAL ACTIONS UNDER SUPERFUND. SECTION 104C MANDATES THAT, BEFORE THE FEDERAL GOVERNMENT EXPENDS ANY MONIES FOR A REMEDIAL ACTION, IT MUST RECEIVE CERTAIN COMMITMENTS FROM THE AFFECTED STATE. FIRST, THE STATE MUST PROVIDE AT LEAST 10% OF THE FUNDS NECESSARY TO ACCOMPLISH THE REMEDIAL ACTION. WHILE THIS SEEMS AN EQUITABLE AND APPROPRIATE APPORTIONMENT OF COSTS, THE SETTING OF A PRECISE LOWER LIMIT TO A STATE SHARE MAY RULE OUT THE TIMELY IMPLEMENTATION OF A NECESSARY REMEDIAL ACTION BECAUSE THE AMOUNT OF MONIES INVOLVED IS

OFTEN SUBSTANTIAL (THE STATE SHARE ALONE FOR JUST ONE OF THESE SITES MAY BE SEVERAL MILLION DOLLARS). CONSEQUENTLY, THE NECESSARY LEGISLATIVE APPROPRIATION, A TIME CONSUMING EFFORT IN ANY LEGISLATIVE BODY, MUST BE MADE. THEREFORE, I PROPOSE THAT THE LANGUAGE BE AMENDED ON THAT SECTION OF THE LAW TO ALLOW THE FEDERAL GOVERNMENT SOME FLEXIBILITY TO ESTABLISH THE APPROPRIATE STATE SHARE WITHOUT SUCH A MANDATORY LOWER LIMIT.

SECTION 104C ALSO MANDATES THAT THE STATE SHALL ASSURE ALL FUTURE MAINTENANCE OF THE REMEDIAL ACTION FOR THE EXPECTED LIFE OF THAT ACTION. IT IS UNCLEAR FROM THE STATUTE WHAT "MAINTENACE" IS AND WHEN THE STATE'S RESPONSIBILITY FOR "MAINTENACE" SHOULD BEGIN. THE STATE BELIEVES THAT THE LEGISLATIVE HISTORY, WHEN READ TOGETHER WITH THE LANGUAGE OF THE STATUTE, CLEARLY DEMONSTRATES THAT IT WAS THE INTENT OF CONGRESS TO HAVE STATE AND FEDERAL GOVERNMENTS SHARE THOSE COSTS ACCORDING TO THE 90% FEDERAL, 10% STATE COST DIVISION FORMULA SPECIFIED IN SECTION 104(c)(3). HOWEVER, OUR RECENT NEGOTIATIONS WITH EPA HAVE BEEN COMPLICATED BY THE FACT THAT EPA BELIEVES THAT THE STATUTE CAN BE READ TO REQUIRE THE STATE TO ASSUME ALL COSTS FOR FUTURE MAINTENANCE OF A REMEDIAL ACTION. WHILE THE STATE BELIEVES THAT THE POSITION OF CONGRESS IS CLEAR ON THIS ISSUE, IT IS OBVIOUS FROM OUR PRESENT NEGOTIATIONS THAT OTHER PARTIES MAY INFER AN ENTIRELY

DIFFERENT MEANING FROM THE LANGUAGE. THEREFORE, IT IS IMPERATIVE THAT CONGRESS TAKES THE INITIATIVE AND CLARIFIES THIS LANGUAGE. THE UNLIKELIHOOD THAT EPA'S READING OF THIS SECTION OF THE STATUTE REFLECTS THE INTENT OF CONGRESS IS FURTHER BORNE OUT BY THE FACT THAT THIS TYPE OF OPEN-ENDED LANGUAGE WOULD POSE A LEGAL PROBLEM FOR MOST STATES IN THAT IT IS OFTEN CONSTITUTIONALLY IMPOSSIBLE FOR A STATE OFFICIAL OR LEGISLATIVE BODY TO COMMIT TO PAY FOR SOMETHING THAT, AT THE TIME OF THE AGREEMENT, HAS NO ESTABLISHED COST. AS NEGOTIATING PARTIES HAVE ALREADY LEARNED, THIS IS USUALLY THE CASE. THE VERY NATURE OF THESE PROJECTS, WHICH OFTEN REQUIRE FEASIBILITY DESIGN AND INTERIM REMEDIAL WORK AS A PREREQUISITE TO THE IMPLEMENTATION OF A FINAL REMEDIAL ACTION, PRECLUDE THE CALCULATION OF MAINTENANCE COSTS WHEN THE AGREEMENTS ARE INITIALLY SIGNED BY THE PARTIES. WHILE I AM NO EXPERT IN FEDERAL CONSTITUTIONAL LAW, I WOULD EXPECT THAT ENTERING INTO OPEN ENDED AGREEMENTS WOULD PRESENT LEGAL PROBLEMS FOR FEDERAL AGENCIES AS WELL. I AM SURE THAT THE FRAMERS OF SUPERFUND DID NOT INTEND THAT PARTIES TO SUPERFUND AGREEMENTS WOULD FLOUT THEIR CONSTITUTIONAL RESPONSIBILITIES IN ORDER TO EXECUTE THOSE AGREEMENTS. THEREFORE, I WOULD SUGGEST THAT WHEN CONGRESS AMENDS SECTION 104(c)(3), ITS INTENT ON THE COST SHARING REQUIREMENTS FOR MAINTENANCE SHOULD BE MADE ABSOLUTELY CLEAR. ALSO SECTION 104(c)(3) SHOULD PROVIDE FOR A LESS OPEN ENDED COMMITMENT OF STATE DOLLARS TO A SPECIFIC SUM THOUGHT TO BE REASONABLE AT THE

TIME ALONG WITH AN AGREEMENT FOR FURTHER NEGOTIATION SHOULD ADDITIONAL MAINTENANCE FUNDS BE NECESSARY.

THE LEGAL PROBLEMS STATED ABOVE ALSO PRESENTED DIFFICULTIES IN PREVIOUS DEP/EPA NEGOTIATIONS IN REGARD TO THE EXACT AMOUNT OF THE STATE'S 10% SHARE OF COSTS. HOWEVER, I AM PLEASED TO REPORT THAT THE STATE AND EPA WERE ABLE TO DEVELOP A PRACTICAL CONTRACTING APPROACH WHICH ALLOWED US TO PHASE THE TASKS OF A REMEDIAL ACTION SO THAT THE PARTIES WOULD NOT COMMIT TO A COST SHARING AMOUNT FOR A TASK UNTIL ANOTHER TASK, THE EXECUTION OF WHICH WAS A PREREQUISITE TO DETERMINING THE COST OF THE NEXT TASK, WAS ACCOMPLISHED. FOR EXAMPLE, IN MOST CASES, A FEASIBILITY STUDY IS NECESSARY BEFORE ANY SPECIFICITY CAN BE DETERMINED AS TO WHAT WORK WILL BE DONE AND WHAT THE COSTS WILL BE FOR A REMEDIAL ACTION. THEREFORE, UNDER THE PHASED AGREEMENT APPROACH, NO COMMITMENT IS MADE WITH REGARD TO THE REMEDIAL ACTION UNTIL THE FEASIBILITY STUDY HAS BEEN COMPLETED. WE BELIEVE THAT THIS IS THE ONLY PRACTICAL METHOD FOR THESE TYPES OF PROJECTS AND SUGGEST THAT THE CONGRESS RATIFY THIS PROCEDURE WHEN IT AMENDS THIS SECTION OF THE STATUTE.

FINALLY, SECTION 104C REQUIRES THAT THE STATE SHALL MAKE "AVAILABLE" AN APPROPRIATE OFFSITE TREATMENT, STORAGE, DESTRUCTION, AND/OR DISPOSAL SITE FOR THE WASTE GENERATED BY THE REMEDIAL ACTION. IT IS UNCLEAR WHETHER IT WAS THE

INTENT OF CONGRESS FOR THE FEDERAL GOVERNMENT OR THE STATE GOVERNMENT TO PAY FOR THIS SERVICE. THE TERM "AVAILABLE" IS UNCLEAR AND THEREFORE, THE NEGOTIATING PARTIES ARE UNSURE OF THE STATE'S PART IN FULFILLING THIS REQUIREMENT. WE WOULD SUGGEST THAT THE COST BE BORNE BY THE FEDERAL GOVERNMENT OR IN ACCORDANCE WITH THE 90%/10% COST SHARING FORMULA OF 104(c)(3).

A SIMPLE TECHNICAL AMENDMENT ON MOST OF THESE ISSUES WILL RESOLVE A NUMBER OF AREAS OF PRESENT OR EVENTUAL DISPUTE BETWEEN THE STATE AND FEDERAL GOVERNMENT WHICH, IN NEW JERSEY'S EXPERIENCE, HAS PROLONGED NEGOTIATIONS AND, IN SOME CASES, WILL OTHERWISE ONLY BE RESOLVED THROUGH EXHAUSTIVE LITIGATION.

THERE ARE VARIOUS INTERNAL PROBLEMS CONCERNING THE EPA, WHICH MUST BE RESOLVED IN ORDER TO SUCCESSFULLY IMPLEMENT SUPERFUND. THE MOST IMPORTANT OF WHICH INVOLVES THE REPUBLICATION OF THE NATIONAL CONTINGENCY PLAN. I DO NOT THINK THAT I CAN OVER-EMPHASIZE THE IMPORTANCE OF THE NCP TO THE SUPERFUND PROGRAM. AS PROVIDED IN THE ACT, THE REPUBLISHED NCP MUST ESTABLISH, IN DETAIL, THE NECESSARY TECHNICAL AND ECONOMIC GUIDELINES FOR THE IMPLEMENTATION OF SUPERFUND. THE NCP MUST SET FORTH THE NATIONAL PRIORITY LIST FOR SITE CLEAN-UP, THE PRIMARY FEDERAL DECLARATION OF WHAT PROJECTS WILL BE

UNDERTAKEN UNDER THE ACT AND, THEREBY, GENERALLY WHEN THEY CAN BE EXPECTED TO BEGIN. THE NCP WILL, IN EFFECT, BE THE "BIBLE" FOR SUPERFUND IMPLEMENTATION. THEREFORE, I WANT TO TAKE THIS OPPORTUNITY TO REINFORCE THE STATE'S CONCERN REGARDING THIS ISSUE AND TO STRONGLY URGE CONGRESS, WHICH NOW HAS THE RESPONSIBILITY FOR REVIEWING THE NCP REVISION, TO CLOSELY EXAMINE THE COMMENTS EPA RECEIVED ON THE DRAFT NCP REVISION THAT APPEARED IN THE MARCH 12, 1982 FEDERAL REGISTER DURING ITS REVIEW OF THE REVISED NCP THAT WAS REPUBLISHED IN THE JULY 16, 1982 FEDERAL REGISTER.

SO FAR, MY TESTIMONY HAS FOCUSED ON THE SHORTCOMINGS OF THE FEDERAL GOVERNMENT IN PROMPTLY IMPLEMENTING SUPERFUND. HOWEVER, I THINK IT MUST BE ACKNOWLEDGED BY THE STATES THAT ALL THE PROBLEMS WHICH HAVE INHIBITED THE PROMPT IMPLEMENTATION OF THIS PROGRAM CANNOT BE PLACED AT THE FEET OF THE FEDERAL GOVERNMENT.

THE CLEAN-UP OF HAZARDOUS WASTE DUMPSITES ARE COSTLY AND TECHNICALLY COMPLEX UNDERTAKINGS. WHILE THE FEDERAL GOVERNMENT HAS PROVIDED FUNDS FOR EFFECTING MOST OF THE CLEAN-UP ACTIVITIES, THE STATES MUST BE ABLE TO PAY THEIR SHARE. AS THE COMMITTEE MEMBERS KNOW ONLY TOO WELL, STEERING A SPECIFIC APPROPRIATION THROUGH A LEGISLATIVE BODY IS OFTEN AS TIME CONSUMING AND DIFFICULT AS ENACTING THE ORIGINAL ENABLING legislation. Therefore, I suggest that other states, genuinely interested in initiating clean-ups, enact legislation similar to New Jersey's to establish the independent state funding sources necessary for Superfund. New Jersey has done this in two ways. The New Jersey Spill Compensation and Control Act of 1977 provides for a Spill Compensation Fund based on a tax on hazardous substances transferred in the State. This fund will serve New Jersey as its primary funding source for Superfund costs. New Jersey has also created a secondary funding source for Superfund costs through the Hazardous Discharge Bond Act of 1981. This legislation allows the State to sell Bonds to provide up to $100,000,000 to perform hazardous waste discharge clean-ups such as those which will be completed under Superfund. These independent funding sources permit New Jersey to provide its state cost share without the need for a legislative search for a funding source and an appropriations process.

The States must also be ready to provide the necessary trained personnel to plan and manage Superfund clean-ups. The States cannot expect the federal government to provide the manpower to perform and manage all Superfund actions. Perhaps more importantly, the states cannot expect the federal government to perform the evaluative work necessary to establish clean-up priorities without responsible state

INPUT. NEW JERSEY ESTABLISHED PROGRAMS FOR THE AMELIORATION OF HAZARDOUS SUBSTANCES DISCHARGED IN THE EARLY 1970'S AND ESTABLISHED A SEPARATE DIVISION WITHIN THE DEPARTMENT TO BE RESPONSIBLE FOR CLEAN-UP ACTIVITIES. SUPERFUND CLEAN-UPS ARE ONE OF THE PRIMARY RESPONSIBILITIES OF THIS DIVISION.

THE EXPERIENCE OF THE PAST TWO YEARS OF SUPERFUND IMPLEMENTATION HAS OFTEN BEEN DISCOURAGING AND FRUSTRATING, ESPECIALLY FOR THOSE IN AND OUT OF GOVERNMENT WHO WORKED SO HARD TO SECURE PASSAGE OF THE ACT ITSELF. I DO NOT THINK THERE IS MUCH TO BE GAINED BY LOOKING BACK AND DISCUSSING WHAT MIGHT HAVE BEEN. IT IS MUCH MORE IMPORTANT THAT WE FOCUS ON SOLVING THE CONTINUING PROBLEMS THAT I HAVE PRESENTED TODAY. AS I STATED ABOVE, THE DEP AND THE EPA HAVE RECENTLY EMBARKED ON A PROGRAM FOR EXPEDITIOUSLY EXECUTING SUPERFUND AGREEMENTS FOR AS MANY SUPERFUND SITES AS POSSIBLE IN NEW JERSEY. THE STATE HAS COMMITTED ALL NECESSARY RESOURCES TO ENSURE THAT THIS PROGRAM IS CARRIED OUT. AS ONE OF OUR GOALS, WE HAVE RESOLVED TO EXECUTE AGREEMENTS ON SIX (6) SUPERFUND LISTED SITES BY THE MIDDLE OF THIS MONTH; THEREBY INITIATING AGREEMENTS FOR THE ORIGINAL 12 NEW JERSEY SITES LISTED BY EPA IN ITS NATIONAL INTERIM SUPERFUND PRIORITY LIST RELEASED IN FEBRUARY OF THIS YEAR. MY IMPRESSION IS THAT EPA IS JUST AS COMMITTED TO THIS PROGRAM AS WE IN THE STATE ARE. I EXPECT THAT EPA'S COOPERATION WITH THE STATE IN THIS EFFORT WILL CONTINUE AND WE CAN REPORT THE ACCOMPLISHMENT OF THIS GOAL TO THE CONGRESS AND THE CITIZENS OF NEW JERSEY BY THE END OF NEXT WEEK.

I WOULD LIKE TO THANK THE COMMITTEE FOR ITS INTEREST IN THIS ENVIRONMENTALLY ESSENTIAL PROGRAM AND FOR THE OPPORTUNITY TO APPRISE YOU OF NEW JERSEY'S OBSERVATIONS ON SUPERFUND IMPLEMENTATION.

NSWMA

National Solid Wastes Management Association

1120 CONNECTICUT AVENUE, N.W. • SUITE 930 • WASHINGTON, D.C. 20036
TELEPHONE (202) 659-4613

EUGENE J. WINGERTER
EXECUTIVE DIRECTOR

Testimony

of

Jeffrey R. Diver
Senior Environmental Counsel
Waste Management, Inc.
Oak Brook, Illinois

On Behalf Of

The Institute of Chemical Waste Management
National Solid Wastes Management Association

to

Subcommittee on Environmental Pollution
Committee on Environment and Public Works
United States Senate

August 4, 1982

- COLLECTION COMMITTEE
- INSTITUTE OF CHEMICAL WASTE MANAGEMENT
- INSTITUTE OF RESOURCE RECOVERY
- INSTITUTE OF WASTE EQUIPMENT DISTRIBUTORS
- INSTITUTE OF WASTE TECHNOLOGY
- LANDFILL COMMITTEE
- WASTE EQUIPMENT MANUFACTURERS INSTITUTE

The Institute of Chemical Waste Management of the National Solid Wastes Management Association is pleased to respond to the invitation to testify concerning implementation of the "Superfund" law (the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, P.L. 96-510). The member companies of the Institute are in a particularly good position to observe performance under the Superfund, as they offer contract services, both to government and the private sector, in the cleanup of spills and uncontrolled hazardous waste sites and in the containerization, transport, treatment and disposal of cleanup materials.

Over the last twelve months, Congress has heard much testimony concerning the delays and deficiencies in implementing the national program for environmental remediation of defunct or derelict hazardous waste storage or disposal sites. Most of the criticisms to date have been warranted, but they have been mainly addressed to the obvious: late development of a National Contingency Plan; failure to develop or even budget for a national inventory of hazardous waste facilities; lack of a complete National Priority List of Superfund targets; impossibly slow progress in bringing potential sites to the remedial action stage; confused, if not chaotic, development and pursuit of an enforcement program; and the seeming inability to use the money already in the Superfund. Add to this list the observation that the law itself is a lawyer's dream - so ripe for challenge and judicial interpretation -- and you have most of the charges to date.

As we expect others will continue to address these points, we wish to focus on three areas which seem to have been given little public discussion: Superfund settlement policy, the politics of emergency response and EPA's failure to develop regulations defining reportable quantities of hazardous substances.

First, there is a pressing need for development of a policy and program intended to promote early settlement of Superfund cases by liable parties. We support the Administration's oft-stated preference for settlement, as opposed to litigation, as the device for cleaning up uncontrolled sites. Unfortunately, the enforcement process - including the settlement component - is being converted into a lawyer's plaything. As an example, prelitigation "notice" letters are being issued by EPA or the Department of Justice to persons allegedly liable for correction of problem sites. However, the letters don't advise what the addressee is alleged to have done to incur liability. And, if the addressees should seek to find out by calling EPA or DOJ, he is stonewalled: he will not be told what he allegedly took to the site or when. Documentary evidence showing a connection to the site will not be shared.

Superfund was intended to achieve protection of health and the environment, not to punish or tantalize waste generators, transporters or disposers nor to provide experience for government or private attorneys in the trial of toxic tort cases. We believe the law's intent will be promoted if a settlement policy with the following features is established:

1. Government disclosure of evidence connecting a person to the site, as well as disclosure of the names of others with an alleged connection.

2. Early convening, at the government's call, of conferences to discuss the possibility of site corrective action without resort to litigation.

3. Establishment of reasonable time frames for the conduct of prelitigation settlement discussions.

4. Willingness to settle with less than all the parties on less than all the necessary removal or remedial actions, with a reservation not to proceed against the settling parties for remaining action until non-settling parties have first been pursued.

5. If a complete settlement of all necessary actions can be accomplished, a willingness to contribute Superfund dollars to the settlement.

6. If settlement discussions bog down, strong consideration should be given to the issuance of cleanup orders.

7. If settlement discussions fail, litigation should be commenced promptly and, if planned removal or remedial actions have been

determined, Superfund dollars should be committed to cleanup while litigation proceeds.

Our second point: Congress and EPA should mutually agree that political or publicity motivations should not be the prime factors in decisions to designate a site for "emergency response." As this subcommittee is aware, most of the Superfund action to date has been confined to "emergency response" (referred to in the National Contingency Plan as "immediate removal"). As EPA has stated, these actions "...are intented for response to situations of immediate and significant harm to human life or health or the environment; these are emergency situations which require rapid immediate response." (47 F.R. 31180, July 16, 1982).

Increasingly, we are seeing decisions on emergency response being made from the top down, not from the bottom up. Political pressures, as opposed to health or environmental emergencies, are determining where and how fast Superfund money will be spent. The "squeaky wheel" syndrome strikes a responsive chord at EPA, which is anxious to dispel a Superfund "do-nothing" image.

We are concerned that actions carried out in the name of "emergency response" will not be subject to prioritization and are not usually the subject of much planning. There is a real probability of response overkill, waste of Superfund dollars, and squandering of program credibility. We urge resistance to the temptation to use emergency response declarations as political or publicity devices.

Our third point concerns establishment of realistic reportable quantities of hazardous substances. In the National Contingency Plan published on July 16, EPA advised that one of the principal means of discovering candidate sites and incidents for response activities is the report of a release under Section 103(a) of the law. (40 CFR 300.63(a)(1) and (b). Key to implementation and enforcement of the reporting requirement is the promulgation of regulations defining a "reportable quantity" of each of the various hazardous substances covered by the law, and explaining under what circumstances a statutory report is required.

Section 102(a) of Superfund requires EPA to establish meaningful reportable quantities. This has not been done. During the Spring of 1981 EPA prepared and sought comments on several drafts of an "Interpretative Rule and Policy Statement," clarifying enforcement policy in the context of interim reportable quantities and the duty to report. No action to establish such a policy or to establish final regulations has ever been taken.

The effect of this failure is to leave the statutorily prescribed one pound reportable quantity for all hazardous substances other than those defined under the Clean Water Act (Section 311 (b)(4)). In our opinion, this is a ludicrous, unenforceable standard, counterproductive to the serious goals of Superfund. It would require a report every time one pound of hazardous waste is spilled during loading or unloading, or one pound of asbestos-containing demolition debris, or one pound of any compound containing silver. It can even be argued that a report should be made each time one pound of a hazardous substance is placed in a landfill or surface impoundment, interim status or not.

The U.S. Department of Transportation has seen this folly and has refused to incorporate Superfund hazardous substances into its regulatory program until EPA establishes final reportable quantity regulations.

We urge EPA to pursue, and Congress to support, publication of at least an interim policy governing reports of releases.

Let us add one last point. For all of the environmental benefits which we believe Superfund will ultimately bring, it also poses a negative. It has distractioned public attention from the present need for effective hazardous waste management through its focus on the practices of the past. Resources must be made available for implementation of the Resource Conservation and Recovery Act (RCRA) as well as Superfund. Dollars and human resources are being committed - at all levels of government - to correct past problems at the expense of preventing the creation of new ones. Federal regulations under RCRA will not be self-effectuating. The commitment of surveillance, permitting and enforcement personnel is required, especially as we move into RCRA Phase II. We ask this subcommittee to keep constantly before it the need for a statutory, budgetary and policy balance between Superfund and RCRA, so we may not be consigned to eternal repetition of past mistakes.

CMA
CHEMICAL MANUFACTURERS ASSOCIATION

STATEMENT OF
DANIEL MCGRADE
OF STAUFFER CHEMICAL COMPANY
ON BEHALF OF
CHEMICAL MANUFACTURERS ASSOCIATION
BEFORE THE
SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION
COMMITTEE ON ENVIRONMENT & PUBLIC WORKS
UNITED STATES SENATE
ON
SUPERFUND OVERSIGHT

August 4, 1982

2501 M Street, NW • Washington, DC 20037 • Telephone 202/887-1100 • Telex 89617 (CMA WSH)

Mr. Chairman, my name is Daniel McGrade. I am Manager, Environmental Control, with the Stauffer Chemical Company in Westport, Connecticut. I am testifying today on behalf of the Chemical Manufacturers Association, a nonprofit trade association whose members--including Stauffer--represent more than 90% of the productive capacity of basic industrial chemicals within this country.

CMA's member companies are directly and materially affected by the federal Superfund law. We are the prime contributors to the 1.6 billion dollar fund. We are often among the parties that the government seeks to hold financially liable in specific waste site cleanup activities.

We accordingly are vitally interested in virtually all aspects of Superfund's implementation. We have established within CMA a "Superfund Task Group"--which I chair--to monitor Superfund developments and to represent our industry's interests in the legislative, regulatory, and judicial arenas.

Mr. Chairman, CMA strongly supports prompt implementation of the national program under Superfund to remedy problems created by inactive waste sites. Our industry is committed to working with federal and state governments under the framework of Superfund to assure that appropriate action will be taken which protects public health and the environment. We believe that the basic structure of Superfund offers a rational and focussed approach for assessing the scope of the national problem and addressing the problem efficiently.

With respect to EPA's implementation of Superfund, it is now only a year-and-a-half since the law was enacted. Much remains to be done and many questions remain to be answered. Superfund mandates that EPA grapple with extremely complex problems for which little information has been available. We think that EPA has made good progress and laid firm foundations which will promote an efficient, rational approach to solving the problems.

Mr. Chairman, one achievement is that the scope of the problem is better defined than two years ago. Then, there was considerable public concern over the potential for harm from a few well-publicized dump sites. This concern was heightened when certain officials indicated that there may be "30 to 50 thousand" such dangerous waste sites. This number was widely picked up and cited in public debates. Much of the public and congressional debate preceding Superfund's enactment was based upon these assumptions. We are now developing a much better grasp on the true nature of the problem, and we now know that the public fears about the extent of the problem were based upon inflated and unsupportable numbers.

The Superfund statute sets up an orderly framework for assessing the true scope of the problem. Under the Section 103(c) "site notification" program, EPA is to develop an inventory of all sites at which hazardous substances have been stored, treated, or disposed. EPA has completed this inventory, and we understand that the inventory contains about 9,600 sites.

After EPA completes its inventory, Superfund then calls for an orderly process of assessing the nature of potential harm from these sites and setting the priorities for them. This will allow the national effort to focus on the true problems. Based upon the number of candidate sites reported by the States to date, we believe that only a fraction of the 9,600 sites will be found to pose real threats to human health and the environment and warrant significant remedial action.

We are not saying, Mr. Chairman, that there are not significant potential health and environmental problems from inactive hazardous waste sites. What we are saying is that we believe that the problem is much more limited and manageable than was generally believed before Superfund became law. We also believe that the problems can be efficiently addressed--and put behind us--with sensible administration of Superfund.

We have time to do this in an orderly fashion. From an environmental standpoint, these sites generally do not present real emergencies. We can figure out the right thing to do for the long range and then do it, thereby assuring the best environmental solutions with maximum benefit from the expenditure of public and private resources. For those cases where a true emergency does exist, the Superfund statute and other existing laws provide ample mechanisms for quick and effective abatement action.

A second achievement is that EPA has published a list of "115" sites and has begun addressing the problems on most of these and recently identified 45 more that will be considered for cleanup under Superfund.

Another achievement of significance is EPA's recent amendments to the National Contingency Plan, which faithfully track the basic statutory framework. The Plan generally offers a rational, cost-effective approach for assessing relative risks, prioritizing sites, and selecting appropriate remedies. In this Plan, EPA has recognized the need for flexibility in selecting remedies. EPA has wisely recognized that each problem site will have unique hydrologic, geologic, environmental and waste characteristics and any attempt to develop detailed criteria to account for all the possible permutations would create unnecessary delays in implementation of Superfund. Now that EPA has laid the basic foundations for its remedial response program, we encourage EPA to undertake full implementation of the program with vigor.

Mr. Chairman, we also believe that EPA is basically taking the most productive approach to waste site remedies where financially responsible parties are potentially liable. EPA's approach, which is fully consistent with Superfund, is to try first to obtain administrative settlements from parties negotiating in good faith, and to initiate costly and time-consuming lawsuits only if such settlement attempts prove unsuccessful. We believe that EPA's approach will result in more timely, efficient, and environmentally protective results than the confrontational "litigate first" approach. To date EPA has gained private party support for cleanups at about 20% of the sites and we expect more as the settlement process is refined.

Mr. Chairman, I can speak personally to the benefits of such an approach based upon a recent example from my own company. Stauffer Chemical Company until the late 60's operated a glue manufacturing plant at Woburn, Massachusetts. Other parties had conducted manufacturing operations on the site before Stauffer bought it. Stauffer sold the site after it closed the plant. Last October, EPA listed the Woburn site as one of the interim "115" Top Priority Superfund sites. On May 25, 1982, Stauffer entered into a Consent Agreement with EPA to conduct a site investigation and develop remedial alternatives. We have already begun the field work on the first phase of the investigation and expect to complete it by the end of this year at a cost to the Company of about $1,000,000. In conducting the negotiations leading to the settlement, EPA actively sought the participation of local citizens, the State of Massachusetts, municipal authorities, and other affected parties. These parties participated actively in the negotiations and are currently participating actively in the implementation of the agreement. The Woburn agreement, I believe, demonstrates that cooperation rather than confrontation can result in prompt, efficient and effective action which is the intent of Superfund.

Mr. Chairman, I have been generally positive thus far about Superfund and EPA's implementation. This does not mean, however, that we are satisfied in all respects either with the statute or with EPA's implementation. As I indicated earlier, we are watching many aspects of the program closely and will continue to express our concerns where we see problems.

For instance, we now have concerns about EPA's policies and procedures for conducting negotiations with potentially responsible parties. While EPA has accomplished fair settlements in some important cases like the Woburn example I mentioned earlier, we fear that in other cases--especially cases where many parties are involved--EPA has not yet developed adequate procedures to promote rapid, good faith settlements. We are also concerned that EPA, by clearly misreading Congress' intent with respect to "preemption," is promoting unfair duplicative State taxation of our industry and overlapping efforts in cleaning up sites.

In closing, Mr. Chairman, I should stress that we believe that this program is important, that EPA is on the right track, and that EPA deserves this Subcommittee's support in implementing its program. The success of Superfund and EPA should not be judged by the amount of fund money spent at this date. EPA should be judged on the number of problem sites that are being addressed, and the effectiveness of the remedies that are developed. We believe that rational use of the fund and the enforcement authorities in Superfund should prove that the problems with inactive waste sites can be put behind us.

I thank you for the opportunity to testify, and would be pleased to answer any questions you may have.

UNITED STATES DEPARTMENT OF COMMER
National Bureau of Standards
Washington, D.C. 20234
OFFICE OF THE DIRECTOR

AUG 30 1982

Honorable Daniel Patrick Moynihan
United States Senate
Washington, DC 20510

Dear Senator Moynihan:

Enclosed are the answers to the four questions which you submitted to the National Bureau of Standards (NBS) to be included in the Committee's record of the meeting of the Subcommittee on Environmental Pollution held on August 4, 1982.

I thank you for the opportunity to present this additional material pertaining to the NBS review of EPA's Love Canal Environmental Monitoring Study.

Sincerely,

Raymond Kammer
Deputy Director

Enclosure

cc: Honorable John H. Chafee ✓

QUESTIONS FOR THE NATIONAL BUREAU OF STANDARDS (NBS)
Raymond Kammer, Deputy Director, NBS, C.C. Gravatt, Deputy Director, NML
and William Kirchhoff, Office of Environmental Measurements and
Chairman of the NBS Love Canal Review Panel

(1) Q: Could you summarize briefly the findings in your May 10, 1982 report reviewing the methodology used by EPA in its Love Canal environmental monitoring study? What specific concerns about the data did you raise?

A: The major findings of NBS, as contained in our May 10, 1982 report, were that (1) chemical identification and quantitation by gas chromatography-mass spectrometry, the primary analytical method used by EPA, was appropriate to the general goals and objectives of the Love Canal Monitoring Study and represented the best overall technique available for monitoring organic chemicals in environmental samples. NBS is not aware of any fundamentally different analytical technique for the identification and quantitation of organic compounds which would have been more suitable for the study as planned. (2) EPA did not define at the outset of the study the limits of detection or the precision and accuracy required to permit comparison of levels of contamination in the Declaration Area with levels which constitute an environmental hazard or with levels currently found in U.S. cities. (3) In the implementation of the monitoring program, the requirement for the identification of the 20 most abundant non-targeted substances was generally not met. Consequently, the possibility of contamination by non-targeted substances has not been conclusively excluded. This deficiency does not invalidate, however, the investigation of targeted substances. (4) The quantitation limits realized by the several water monitoring laboratories for individual analyses varied by more than a factor of ten. Few laboratories reported quantitation limits as good as those reported by the EPA laboratory responsible for the water monitoring effort. Comparisons of quantitation limits with data provided by EPA from other studies indicated that the contract laboratories were not uniformly performing at the state of the art in the water monitoring program. (5) EPA had not used, as fully as it could have, the quality assurance data it had acquired, to derive and confirm estimates of precision, accuracy, and limits of detection. EPA had not, in the draft report that NBS reviewed, incorporated estimates of precision, accuracy, and limits of detection into its validated data base, thus making difficult, if not impossible, any further interpretation of the data by scientists other than those intimately familiar with the details of the study. It is the view of NBS that data, including data noted as "trace" or "none detected," which are not accompanied by indicators of uncertainty, are incomplete and of limited usefulness for further interpretation or further drawing of conclusions by those unfamiliar with the process whereby the data were derived.

(2) Q: NBS agreed to review the EPA monitoring program on August 17, 1981. Your final report was not completed until May 12, 1982. Can you explain why the review process took nine months to complete?

A: The time required by NBS to perform this review was influenced by three factors: (1) A complete report on the Love Canal Monitoring Study was not made available to NBS at the time NBS initiated its review, (2) NBS did not receive all documents from EPA at the start of the study period and (3) the EPA report was undergoing numerous revisions, partly in response to comments from NBS, and was not in a complete state until February 17, 1982. Without a complete report, NBS could not judge whether EPA presumed too much or too little about the accuracy of the analytical data or judge whether the description of the analytical methodology or the quality assurance program was sufficient to allow scientists to interpret further the data acquired by EPA. The following is a chronology of the NBS review process:

On August 17, 1981 NBS agreed by letter to perform the review. To carry out the review a panel was formed of NBS scientists with expertise in organic analytical chemistry, quality assurance, and statistics.

On August 18, EPA provided NBS with the initial documents to be reviewed. These documents included contractor plans, tables of data derived from samples taken from the Love Canal Study area, quality assurance audit reports, and those portions of a preliminary draft of the EPA report describing the quality assurance program. On August 25, NBS was given an oral briefing by officials of EPA and representatives from the prime contractor, the GCA Corporation, on the Love Canal Monitoring Study. During the period August 18 to November 19, NBS continued to receive documentation from EPA, as requested by NBS.

On Decemeber 9, NBS submitted to EPA a written review of the material received by that time. The review described steps that should be taken by EPA in the preparation of its final report to allow readers of that report to interpret the data acquired in the Love Canal Monitoring Study and to understand fully the limitations of those data.

On December 15, EPA and NBS representatives met to discuss the December 9 NBS review. In EPA's judgment, NBS had not yet fulfilled EPA's request. NBS indicated it could proceed no further without a complete copy of EPA's proposed final report. As a result of that meeting, EPA provided NBS with a copy of a draft report on December 17. However, NBS was informed that sections of that EPA draft report dealing with the analytical methodology and the quality assurance program were undergoing revision in response to the NBS December 9 submission. Consequently, EPA requested that NBS not review the material in this draft, but wait for the material EPA was then in the process of revising. By February 17, 1982 all revised material was received by NBS.

On March 17, NBS completed the first draft of its review of the revised EPA draft report. This draft served as a working document, and underwent several revisions until the NBS Panel had reached a consensus position. On April 15, at EPA's request, NBS briefed EPA on the general findings of the NBS review, although at that time NBS had not yet completed the internal review of its written report. This internal review was completed on April 29. Following editorial revision, the NBS review was delivered to EPA on May 10, 1982.

(3) Q: The NBS letter to EPA Region II Deputy Administrator Richard Dewling dated July 9, 1982 has received much attention. The comments in the letter are, it is pointed out, intended to supplement not replace NBS' May 10, 1982 report. Some have pointed to parts of the letter as an endorsement of the EPA monitoring study. Others point to the closing paragraph and specifically to the sentence that reads, "NBS is not able to provide a general characterization of the EPA study because there are not quantitative statements of the precision, accuracy and minimum detection limits for data requirements for the study." Could you now give us a "general characterization" of your July 9 letter? For what purpose was it written? Does it not raise more questions than it answers about the monitoring study?

A: The purpose of the July 9, 1982 letter to Dr. Dewling was to put in writing statements made by Mr. Kammer and Dr. Gravatt on July 8, 1982, at a meeting with officials from EPA, and the Departments of Justice and Health and Human Services.

The principal issues discussed at that meeting were the procedure used by EPA to arrive at the method detection limits (MDL) listed in Tables C-1 and C-3 of its final report, and the use of these MDLs by EPA to determine "worst case values" for the "non-detected" and "trace" statements in the EPA report. The representatives of the HHS, who had performed the evaluation of the habitability implications of the EPA monitoring study, were concerned over issues raised by the May 10 NBS report. Specifically, the HHS officials stated they were having difficulty interpreting whether the NBS review implied that EPA data listed as "non-detected" or "trace" could contain "worst case values" in the parts per million range. In order to respond to these concerns, officials from EPA stated that they would provide to HHS a listing of "worst case values" determined from MDLs. NBS was asked to comment on EPA's procedure for determining MDLs. It was the assessment of NBS that the procedure used, a procedure which had appeared in the American Chemical Society's publication Environmental Science and Technology, Vol. 15, pp 1426-35, 1981 was reasonable and appropriate. In our view, the MDLs obtained from this approach could be used for data analysis requiring minimum detection limits. We listed three conditions with respect to our opinion.

(1) EPA should present the raw data and the chain of logic used to arrive at the MDL appropriate to each laboratory doing analyses.

(2) EPA should compute the actual minimum levels of detection for the measurements as made in the laboratories. That is, they should replace the "zeros" and "traces" in their data with "not more thans".

(3) EPA should demonstrate that the 38 compounds for which MDLs have been stated are representative of the targeted compounds for the Love Canal water samples.

These statements were consistent with our May 10 report and do not represent a change of position by NBS. It had not been the position of NBS in its May 10 report that the procedure used by EPA to arrive at its method detection limits was unreasonable or inappropriate. Rather, NBS had pointed out that EPA had not fully used its quality assurance data to confirm the estimates of the MDLs. Our report dealt with many issues in addition to MDLs, but MDLs were the main issue of interest to EPA and HHS at the July 8 meeting and therefore the major topic of the July 9 letter.

Two other questions were raised at the July 8 meeting, the answers to which were provided in the July 9 letter to Dr. Dewling. NBS was asked if it would be willing to certify the data contained in the EPA report. NBS cannot, and could not under any circumstances, certify such data. Data, and this is true for any technical report or publication are the responsibility of the authors--in this case EPA.

The statement does not imply either an acceptance or rejection of the EPA data by NBS. Rather, it is only a statement that certification of data can only be done by the person who made the measurements. NBS issues "Certificates of Analysis" and similar documents in the normal conduct of its programs, but these are only for measurements made by NBS.

NBS was also asked whether it endorses the statement made by EPA in its final report that the NBS review did not identify any problems that would affect the conclusions of the EPA monitoring program. In the July 9 letter, NBS stated that although it had identified deficiencies in the EPA draft report, it could not comment on the significance of those deficiencies to the conclusions of the EPA report, because such an evaluation would require knowledge of health effects and mechanisms of chemical migration and degradation in addition to knowledge of chemical analysis. In this case, NBS is knowledgeable of chemical analysis only.

Both EPA and CDC were looking to NBS for a general characterization of the EPA study rather than the comments on particular issues to which we in our review have confined ourselves in accordance with the original assignment from EPA. NBS is not able to provide a general characterization of the EPA study because there are not quantitative statements of the precision, accuracy and minimum detection limits for data requirements for the study. In the absence of such a quantitative statement, general characterizations will have to come from the experts drawing conclusions from the study--namely, EPA and CDC.

(4) Q: Can NBS certify that the assurances that EPA made to HHS on July 8th, concerning trace and non-detectable values not exceeding the parts-per-billion range, are based upon a statistically valid interpretation of the data?

A: No, only EPA can do that. The procedure used by EPA to calculate "not exceeding" or "worst case" values is based on a statistical procedure published in *Environmental Science and Technology*, Vol. 15, pp 1426 - 1435, 1981. Deviations from the procedures for the specific case of the Love Canal data are described by EPA in Appendix C of their Report, and in the memorandum from Budde and Booth to Dewling dated July 9, 1982 included in the EPA publication "Environmental Monitoring at Love Canal - Interagency Review". NBS has stated that this approach is reasonable and appropriate. (Additional discussion on this question is contained in the answer to (3) above).

The methodology selected and used by EPA is appropriate for measuring concentrations in the low parts-per-billion range for air and water samples. However, using appropriate methodology does not guarantee reliable results. Thus, the question that remains is the level of performance of the laboratories conducting the analyses. At the low parts-per-billion level, the contract laboratories displayed wide variability in performance. Well-documented statements of precision and accuracy are critical since these provide the only valid basis for assessing the meaning of the numerical data to those who wish to draw their own conclusions from the report. Without such documented statements of precision and accuracy, the results of measurements are of limited usefulness for making comparisons within and among sites. As we reported in our May 10, 1982 review, "Unless measured values, including 'none detected,' are accompanied by estimates of uncertainty, they are incomplete and of limited usefulness for further interpretation and for drawing conclusions." For these reasons, performance "...in the low parts per billion range" has not been demonstrated to our satisfaction in the documentation.

It appeared from presentations made by others during the recent hearings that measurements at the one part-per-million level were of more concern for decision making than the low parts-per-billion level. Based on knowledge of the analytical methodology used by EPA and the documentation provided by EPA, NBS has no reason to believe that measurements labeled "none detected" or "trace" represent concentrations above one part-per-million.

UNITED STATES DEPARTMENT OF COMMERCE
National Bureau of Standards
Washington, D.C. 20234
OFFICE OF THE DIRECTOR

AUG 30 1982

Honorable Daniel Patrick Moynihan
United States Senate
Washington, D.C. 20510

Dear Senator Moynihan:

This is in response to your letter of August 12, 1982, requesting that the National Bureau of Standards (NBS) review the final documents released by the Environmental Protection Agency (EPA) on the Love Canal Monitoring Study.

You have asked NBS to assess the adequacy of the analytical methodology, quality control and quality assurance programs to measure organic chemicals "...in the low parts per billion range." Since my testimony before the Subcommittee on Commerce, Transportation, and Tourism, NBS has examined the EPA final report. My comments below are directed only to the air and water measurements, as limitations in the state-of-the-art for measuring biota and soils and sediments resulted in EPA appropriately focusing its study principally on air and water.

Before I respond to your question, I would like to clarify a related issue. In the testimony of others and in some press accounts, much has been made of the unwillingness of NBS to certify the EPA data. NBS cannot certify any analytical chemical data other than data produced by NBS. Our unwillingness to certify the EPA data does not imply that it is good or bad. It is simply a recognition that analytical chemical data in any technical report can only be certified by those responsible for the data.

The methodology selected and used by EPA is appropriate for measuring concentrations in the low parts-per-billion range for air and water samples. However, using appropriate methodology does not guarantee reliable results. Thus, the question that remains is the level of performance of the laboratories conducting the analyses. At the low parts-per-billion level, the contract laboratories displayed wide variability in performance. Well-documented statements of precision and accuracy are critical since these provide the only valid basis for assessing the meaning of the numerical data to those who wish to draw their own conclusions from the report. Without such documented statements of precision and accuracy, the results of measurements are of limited usefulness for making comparisons within and among sites. As we reported in our May 10, 1982 review, "Unless measured values, including 'none detected,' are accompanied by estimates of uncertainty, they are incomplete and of limited usefulness for further interpretation and for drawing conclusions." For these reasons, performance "...in the low parts per billion range" has not been demonstrated to our satisfaction in the documentation.

It appeared from presentations made by others during the recent hearings that measurements at the one part-per-million level were of more concern for decision making than the low parts-per-billion level. Based on knowledge of the analytical methodology used by EPA and the documentation provided by EPA, NBS has no reason to believe that measurements labeled "none detected" or "trace" represent concentrations above one part-per-million.

In sum, NBS examination of the final EPA report confirms the observations that NBS has already made in the review that we submitted to EPA on May 10, 1982.

I am available to discuss this issue further with you or your staff.

Sincerely,

Raymond G. Kammer
Deputy Director

Identical letters sent to:
Honorable Alfonse M. D'Amato
Honorable John J. LaFalce

UNITED STATES DEPARTMENT OF COMMERC
National Bureau of Standards
Washington, D.C. 20234
OFFICE OF THE DIRECTOR

AUG 3 0 1982

Honorable John H. Chafee
United States Senate
Washington, DC 20510

Dear Senator Chafee:

On Wednesday, August 4, your Subcommittee on Environmental Pollution of the Committee on Environment and Public Works held an oversight hearing on implementation of the Comprehensive Environmental Response Compensation and Disability Act of 1980. At that hearing, testimony was presented on the Love Canal Monitoring Study conducted by the U.S. Environmental Protection Agency (EPA). The National Bureau of Standards (NBS) review of the EPA Love Canal Monitoring Study was mentioned frequently by several of the witnesses, both in their testimony and in the question and answer period. There appeared to be confusion concerning NBS' role and actions in the Love Canal Monitoring Study. I would like to clarify the record on this matter.

The area of confusion concerns the events which took place between May 10, 1982, when NBS submitted its review to EPA, and July 14, 1982, when EPA released its report. During this period, NBS participated in three meetings with representatives of EPA and other agencies which resulted in a letter I sent to Dr. Richard T. Dewling, Deputy Administrator of EPA Region II on July 9, 1982. I will now describe for you those meetings and the significance of the July 9 letter.

Following the transmittal of the NBS report to EPA on May 10, NBS had no further contact with EPA on the matter of Love Canal until a previously scheduled meeting on June 15 between the Administrator and Deputy Administrator of EPA; Dr. Ernest Ambler, the Director of NBS; Dr. C. Gravatt, Deputy Director of the National Measurement Laboratory, NBS; and myself. Although the purpose of the meeting was to discuss joint, NBS-EPA programs in general, the Love Canal review was discussed. NBS was informed that the representatives of the Department of Health and Human Services, who had performed the evaluation of the health consequences of the EPA monitoring study, were concerned over issues raised by the May 10 NBS report. Both NBS and EPA agreed to a subsequent meeting at which issues raised by NBS in its report could be discussed by those in EPA and NBS familiar with the details of the EPA study and the NBS review.

Two subsequent meetings took place, the first of which occurred at NBS on June 28. Present were representatives from EPA, NBS, and the Department of Justice. The principal issue discussed at that meeting was the procedure used by EPA to arrive at the method detection limits listed in Tables C-1 and C-3 of EPA's final report. On July 2, 1982, I informed Dr. Dewling by telephone that the procedure used by EPA, a procedure which had appeared in the American Chemical Society's publication Environmental Science and Technology, was reasonable and appropriate. This statement is consistent with the May 10 NBS report and does not represent a change in the NBS position. NBS had never stated that the procedure used by EPA to arrive at its method detection limits was unreasonable or inappropriate. Rather, NBS had pointed out that additional quality assurance data acquired by EPA could be used to confirm the estimates of the method detection limits.

The second meeting was held on July 8, 1982 and included representatives of NBS, EPA, the Department of Health and Human Services and the Department of Justice. Again, the principal issue discussed was the procedure used by EPA to arrive at the reported method detection limits. We confirmed the statements I had made to Dr. Dewling in my July 2 telephone conversation, a confirmation I reiterated in a letter to Dr. Dewling on July 9.

In no way does my letter of July 9 to Dr. Dewling constitute a reversal or withdrawal of the NBS May 10 report. In our May 10 report, we urged EPA to incorporate estimates of precision, accuracy and limits of detection into its validated data base. In the meeting on June 28, EPA outlined a procedure for doing so. I stated in my July 9 letter that their procedure for determining method detection limits was a reasonable approach provided that three conditions were met, conditions which drew upon our May 10 report.

Two other questions were raised at the July 8 meeting, the answers to which were provided in my July 9 letter to Dr. Dewling. NBS was asked if it would be willing to certify the data contained in the EPA report. NBS cannot, and could not under any circumstances, certify such data. Data, and this is true for any technical report, are the responsibility of the authors--in this case EPA.

NBS was also asked whether it endorses the statement made by EPA that the NBS review did not identify any problems that would affect the conclusions of the EPA monitoring program. In my July 9 letter, I stated that although NBS had identified deficiencies in the EPA draft report, it could not comment on the significance of those deficiencies to the conclusions of the EPA report because such an evaluation would require knowledge of health effects and mechanisms of chemical migration and degradation in addition to knowledge of chemical analysis. In this case, NBS is knowledgeable of chemical analysis only.

Senators D'Amato and Moynihan and Representative LaFalce recently requested further NBS comments on the EPA Love Canal Monitoring Study. In light of the Committee's interest in this matter, a copy of that letter is enclosed.

Thank you for affording NBS this opportunity to clarify the Record. If I can provide any further information regarding NBS' role in this matter, please do not hesitate to contact me.

Sincerely,

Raymond Kammer
Deputy Director

Enclosure

cc: Senator Moynihan
Senator D'Amato
Representative LaFalce

STATEMENT FOR THE RECORD
by the
OFFICE OF TECHNOLOGY ASSESSMENT
for the
HEARING of the SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
AUGUST 4, 1982

The Office of Technology Assessment is submitting this written testimony for the record in response to a request by the Honorable John H. Chafee, Chairman of the Subcommittee on Environmental Pollution. Chairman Chafee asked OTA to assess the final National Contingency Plan (NCP) recently set forth by the Environmental Protection Agency as mandated by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980.

First, we will present the results of our analysis on the Hazard Ranking System (HRS), a key component of the NCP. There are several technical shortcomings in this methodology to rank sites for the National Priority List (NPL). The major consequence of these problems is that sites that present substantial threats to public health and the environment may not get a sufficiently high enough numerical score to qualify them for funding. For each problem OTA has examined, an alternative to the current scoring procedure (without changing the HRS), is suggested in order to obtain scores more indicative of actual risks without delaying the program.

Second, we discuss the benefit of introducing some means to incorporate technical information not now called for in the HRS. Such information may better describe the risks associated with sites. If such information is used, then States and private parties will have an incentive to obtain additional important data. EPA could devise a procedure to use such supplementary information to calculate a modified HRS score.

Third, we point out two important areas that are treated differently in the National Contingency Plan from recent EPA guidance for establishing the National Priorities List. In the guidance, there is a detailed description of the categories to be used as part of the National Priorities List to indicate the status of any actions ongoing or planned by EPA and the States, but in the NCP there is no mention of this procedure. Updating the NPL will be done quarterly according to the guidance, but the NCP speaks only of at least one revision annually.

Fourth, we discuss the way in which the NCP deals with the issue of: "How clean is clean?" Rather than set standards for determining the appropriate extent of remedy at a site, the NCP dictates a process for examining remedial action alternatives and selecting one. There are concerns over the uncertainties of this approach and because final and permanent solutions may be traded-off for initially less costly remedies in the short term. In the long term, however, short term remedial actions could incur substantial costs, including monitoring, surveillance, maintenance, operation and cleanup costs when site containment systems fail.

PROBLEMS WITH THE HAZARD RANKING SYSTEM

Hazardous Waste Quantity. In determining a score for waste characteristics only the most hazardous substance is considered; however, all hazardous substances at a site are used in the HRS to quantify the amount of hazardous waste present. One problem is that a site may have considerable amounts of less hazardous waste combined with a small amount of highly hazardous waste, thereby making the site a highly ranked threat. In contrast, another site may have a similar small amount of the same highly hazardous waste but no other materials. This latter site is likely to get a low score. The issue is that a relatively small quantity, up to 10 tons, of a very concentrated, very hazardous waste could get a low score, even though it presents a substantial risk if it is released to the environment. Moreover, the procedure used to estimate quantities of uncontainerized wastes likely in older, unplanned and possibly illegal dumps will lead to a low quantity score as compared to dumps with drums whose contents may be dilute solutions. This is a particularly troubling problem in combination with a relatively low population served factor (discussed next). A relatively small quantity which upon release became distributed to a relatively few people could constitute a very high dose to the exposed population. Hazard and risk levels to individuals, therefore, may not be related to the waste quantity factor as used in the HRS. One way to solve this problem is to instruct users of the HRS to use a maximum score for waste quantity if the toxicity-persistance matrix score is 12 or greater for the ground and surface water cases or the toxicity score is 2 or greater for the air case.

Population Served. EPA has made a significant improvement over the system used for establishing the interim priority list in this area. Using the population served for the ground and surface water routes, as they have done in the HRS, rather than the total population density within an arbitrary area is more technically correct for indicating relative risk levels. However, there is still an issue concerning population served. When the population served score is low and when the quantity factor is low, the final HRS scores are very low. Based on scores necessary to achieve a high enough ranking for funding with the interim priority list, low population in combination with low quantity yield scores too low to achieve funding. This result can be criticized from the viewpoint that sites in more areas that present very high risks to relatively few individuals, up to 100 people for example, will not get ranked high enough for funding. While it is reasonable to believe that sites for which the population served is high may present substantial threats to large numbers of people, it must also be recognized that a number of factors may exist to reduce the risks associated with these higher ranked sites. Population served is only an indicator for actual risks. The actual number of people receiving an exposure and the actual dose received may not be proportional to the population served. The current HRS is based on an implicit policy or value judgment that CERCLA funds should be spent when large numbers of people may be at some risk, but that no funds or remedial action may be offered when relatively few people are at even very high risk. The principal of offering a cost-effective remedial action, which is embodied in CERCLA, rather than no action at all is, therefore, not being implemented with the HRS. One way to eliminate this problem is to instruct users of the HRS to use the maximum score for population served if the score from the toxicity-persistance matrix is 12 or greater in the ground and surface water cases, and 2 or greater for toxicity in the air case.

Distance to Exposure Point. For each of the three major routes of exposure there is a target factor for distance. For ground water it is the distance to the nearest well that draws water from the aquifer of concern, for surface water it is the distance to the water intake, and for the air route it is the distance to a sensitive environment. These are reasonable factors to be used if there has been no release observed from the site. The shorter the distance, the greater is the presumption of hazard. If, in response to the first question in the HRS, a release has been observed and, therefore, the score is the maximum, and if such releases are observed at the exposure point, then there is little reason to place some sites at a disadvantage because the target distance is high relative to other sites. If a release has been observed at the exposure point and the distance to the exposure point is great, then it is reasonable to conclude that the release from the site has traveled further and the degree of hazard associated with the site is greater than if the distance had been smaller. One way to minimize this effect is to instruct users of the HRS to use the maximum score for target distance if a release has been observed at the exposure point.

USING ADDITIONAL TECHNICAL INFORMATION

Using the HRS to process substantial amounts of information on many sites in order to differentiate among hazard levels has merit. However, there are types of technical information not called for in the HRS which can be very useful in assessing relative levels of hazard. Such data include, for example, information on the amount of observed releases, whether the release is the most hazardous substance at the site, possible attenuation of the release along a route of transport, particularly sensitive populations receiving known doses, transient populations now excluded that may receive sufficient exposure for acute toxic effects, and populations served but associated with wells or water supply intakes farther away than 3 miles from the hazardous waste. The issue is the extent to which the current procedure of only using the data the HRS calls for may lead to false negative results; that is, the possibility that relatively high hazard sites may not get a high ranking. The following statement is in the preamble to the NCP: "the NPL will be reviewed periodically and a release can be added if more extensive data indicate a more significant hazard at the release." Although the concept of using better information is expressed, the idea of using information not incorporated explicitly and mathematically in the current HRS is absent. Some means could be devised by EPA to modify HRS scores on the basis of additional technical information. This would provide an incentive for States and private parties to obtain and provide more detailed and relevant information.

NCP DIFFERS FROM EPA GUIDANCE

OTA has examined an EPA guidance memorandum dated June 28, 1982 from William N. Hedeman, Jr. to EPA Regional Superfund Coordinators. The guidance establishes procedures for implementing the National Priorities List.

An important part of the guidance is the section entitled "Presenting the List". According to this section, sites on the NPL would be classified according to 12 categories of actions ongoing or planned by EPA and the States. OTA believes that such information is extremely important to the Congress, affected parties and the public in order to assess the effectiveness and progress of the CERCLA program and, in particular, how funds are being spent. EPA notes in its guidance that it has responded to public concerns on this issue, however this section is not in the final NCP.

Another difference is that the guidance states that EPA plans to update the NPL on a quarterly basis and states that "updating the list quarterly will have a substantial impact on how the project is managed." However, the published NCP only speaks of updating at least annually. A distinct advantage of frequent updating is that obtaining and using improved technical information on sites is promoted. Frequent updating could act as an incentive for States and private parties to obtain improved information for site evaluation.

Congress may wish to consider having EPA make a more binding statement or modification to the NCP that explicitly commits EPA to classifying NPL sites and to quarterly updates of the NPL.

HOW CLEAN IS CLEAN?

The extent of remedial action has been one of the most contentious issues in the NCP. EPA has stated that the remedial investigation should include "the gathering of sufficient information to determine the necessity for and proposed extent of remedial action," and that "the appropriate extent of remedy shall be determined by the lead agency's selection of the remedial alternative which the agency determines is cost-effective."

The uncertainty regarding the extent of cleanup remains. It is possible to select an alternative that may remove the most immediate risks associated with a site, but that is not a permanent solution to the problem. Funds could be spent on relatively temporary remedies. Moreover, without standards as to acceptable levels of releases from sites, it is difficult to know whether or not a remedy is satisfactory.

Short term remedial actions could necessitate costly but more permanent remedial actions at some future time. This problem impinges on the more general area of concern faced by the States that are now required to commit 10 percent of the direct remedial action costs and all of the operating and maintenance costs for the remedial action. Without more specific criteria for the extent of remedial action, it is difficult for States to know exactly what their costs will be, particularly future costs. If the remedial alternative chosen is not a truly permanent solution but is temporary, for example by providing some form of encapsulation of a leaking landfill, then the State may face uncertain future liabilities.

In its examination of the NCP, Congress may wish to consider more explicit language in the NCP that establishes (1) the preference for remedial solutions to effect permanent cleanup; (2) standards for allowable levels of releases from sites after remedial action consistent with existing Federal and State standards for levels of toxics in the environment or available scientific information, and (3) an interpretation of cost-effective as including all known and reasonably projected costs of any nature to all parties with potential financial liabilities for cleanup, for third party damages arising from insufficient cleanup, and for indirect infrastructure requirements (for example, roads, security and fire protection provided by municipalities or States).

TESTIMONY BY THE ECUMENICAL TASK FORCE OF THE NIAGARA FRONTIER, INC. REGARDING THE ENVIRONMENTAL PROTECTION AGENCY REPORT ON LOVE CANAL.

The Ecumenical Task Force of the Niagara Frontier, Inc. (ETF) has been the Interfaith Response to the Love Canal disaster since March 1979.

From time to time, the ETF has participated in Hearings relative to its mandate of affecting public policy on behalf of the victims of Love Canal.

The recent release of the Environmental Protection Agency (EPA) Report on Love Canal has raised serious questions relative to:

1. The question of habitability
2. The limitations of testing, specifically as indicators of effects on biological systems
3. Choice and utilization of control areas with specific concerns about sampling procedures
4. Related policies of law

We therefore wish to address these areas in written form, since our request for inclusion in the spoken Hearings was denied.

I. THE QUESTION OF HABITABILITY

Following the extensive testing program at Love Canal and in "comparison areas in Niagara Falls, N.Y.," the Department of Health and Human Services (HHS) agreed to provide EPA with an "independent evaluation of the results of those tests with respect to their implications for human health."

The final question asked of a panel of 11 non-federal expert consultants, was "based on available data, can you conclude that the area is not habitable?" (page 1)

In a section of general comments, the HHS Evaluation concludes that "sufficient consensus is present to permit conclusions on the major issues involved." (page 2)

Yet a study of the individual, independent scientific evaluations raises a number of serious questions regarding habitability.

Five of the eleven answered "no" to the question of habitability. Dr. Robert Tardiff, Dr. Steven D. Aust and Dr. Beverly Paigen's negative responses were based upon their conclusion that the data could not provide a positive response to habitability.

Dr. Robert Metcalf wrote that he "does not believe that it would be responsible to advise inhabitants that the area is totally safe. Certainly he (Metcalf) would not want to expose himself, his family or his friends to these hazards of chemical pollution through lifetime residence there."

Dr. Joseph Highland noted that "one would have to say that no one should be encouraged to relocate in the Love Canal area based on what we know today."

In addition to thefive, Dr. John Doull raised a concern regarding the "ability of any legislative or regulatory group to maintain proper control and surveilance of any residential area over extremely long periods of time. Thus, he writes, "I would not advise residents to move out of the area, but neither would I encourage new residents to move into this area."

Other scientists on the panel, while answering "yes" to the question of habitability, raised questions. Dr. Samuel Milham felt that the area was habitable "if the integrity of the clay cap and covering turf can be maintained and the barrier drain system properly operated." Dr. E.D. Pellizzari noted "based on the available data from this study design, the area appears to be habitable. More importantly, the data should be re-analyzed to determine whether any one household might be considered at a greater risk...Perhaps each location (household) in the Declaration Area should be individually evaluated."

Based upon this study of the independent scientific review, the Ecumenical Task Force questions seriously the HHS statement that there is a sufficient consensus regarding the issue of habitability. In fact, it appears that there is hardly even a majority in favor of habitability in the Declaration Area at Love Canal.

Tangental to this critical scientific discrepancy, is the fact that the contractural arrangement between EPA and this Scientific Review Panel as not observed, specifically the proviso that all results of the scientific review by all eleven members of the panel would be made readily available to the public. We have attempted to secure a copy of this scientific review from the local office of EPA, from the U.S. Government Printing Office, from the offices of our Congressional Representatives. In all cases, we were denied. Certainly, affected residents were given no copies. We have real concerns, obvious concerns, as to why dissenting scientific opinions were not made as available to the public as was the 7/13/82 HHS estimate of habitability.

I. THE LIMITATIONS OF TESTING, SPECIFICALLY AS INDICATORS OF EFFECTS ON BIOLOGICAL SYSTEMS.

Upon review of the "Limitations" of the Environmental Monitoring At Love Canal, Vol. I (Section 1.1.6) study, the following questions arise:

1. Since "...the project was conceived, initiated, and conducted under severe budgetary and time constraints." (emphasis ours), is it not possible that since then a more thorough and better planned project could have been started, or that the 3 month project could have been continued for 6 or 12 months, or longer? Improvements in the projects were desirable and additional time and money would have helped in many ways.

2. The exact nature of the acknowledged limitations imposed by chemical and biological sampling methodology (i.e. stratified vs. judgement sampling) are not stated; we could logically expect that biased sampling would produce biased results, and therefore biased (and inaccurate) conclusions.

3. On page 16 of Vol I (Preceding the "Limitations" section) it is stated, "A limited biological sampling program was conducted by EPA at Love Canal for the purpose of investigating the use of local biological systems to monitor the biological availability and biological accumulation of substances found in appropriate environmental

media." It would seem that the numerous human health questions being asked by Love Canal residents, public officials, and interested advocacy groups (such as ETF) would have necessitated a very heavy emphasis on biological sampling. Given the advanced state of systematic toxicologic testing with biological organisms at the time, why was this "...limited biological sampling..." not openly acknowledged as a limitation to the study?

As a consequence, there now exists a major gap between health effects observed by former Love Canal residents (and a part of their medical records), and the projected "non-effects", based primarily upon chemical testing. Many Biologists have long known that a well-planned, systematic, bioassay approach can demonstrate a wide range of biological system and biochemical effects, and that those effects can be verified with considerable reliability. Indeed, much of what is acceptable today as "scientific proof" of the risk levels of certain foods, drugs, pesticides, and innumerable commercial products is based largely on this body of proven methodology. The quantity and the types of biological sampling appears grossly inadequate in view of the human and ecological dimensions of the problem under consideration.

4. A "3-month time series of date" cannot take into account the extreme environmental rigors of the study site. Given the climatic variation in this geographic area from season to season (and from year to year), the extraordinarily short study period would impose limitations which are not listed or considered in this section of Vol. I. Consequently, we are left wondering to what extent we can expect the Love Canal dumpsite to "respond" to natural events of local weather extremes; and, what will be the nature of those "responses". One could conjecture that this matter is either of no concern to EPA, or beyond their knowledge, or that we must "wait and see"; EPA should have declared which of these three (or other) operational possibilities they have selected.

5. There is a cursory mention of "...the statistical limitations and uncertainties associated with all sampling designs..." Those persons familiar and knowledgeable of these problems usually explain what those limitations are, and then suggest or devise other ways to study those aspects which are left unclear. Was that done in this study? Or, are these acknowledged statistical limitations something we must accept because EPA was either not clever or energetic enought to pursue the problems of "statistical limitations and uncertainties"?

IIIL CHOICE AND UTILIZATION OF CONTROL AREAS WITH SPECIFIC CONCERNS ABOUT SAMPLING PROCEDURES.

The EPA Report does not address the concerns of the residents of the Love Canal area and Niagara Falls area. Further, the report does not present a safety analysis nor contain a risk assessment. There is no habitability study available. In our opinion, the burning question is what are the future risks attendant on repopulating the Love Canal area. The report does not mention risks.

The report titled "Environmental Monitoring at Love Canal" is an accurate description of how far the report goes. A risk analysis would typically begin with an environmental measurements program. The results of the environmental measurements would be used to estimate the extent of lifetime exposure of a hypothetical population to toxic materials. The exposure estimates are then related to toxicity information to provide an over-all risk estimate on a substance by substance basis. The EPA has only reported the results of the first phase of analysis. There are lists of 400 different chemical substances in the Love Canal. That would imply that 400 risk analyses, one for each substance, are needed to totally assess the risks. In the present study about 150 substances were monitored in the environment.

Specific concerns relative to the sampling are as follows:

1. Sump Water:

EPA managed to examine 33 sumps in the Emergency Declaration area, 13 in the inner rings and only one in all of greater Niagara Falls and Grand Island. They sampled this single location 5 times so that there is only independent sample, not five.

The detailed results show that 3 different laboratories analyzed the same water sample from the same pump with inconsistent results. The 5 evaluations reported from 0 - 8 pesticides in the sample. As a matter of fact, the same laboratory working on water samples obtained 15 days apart, produced both the 0 and 8 pesticide reports. Another laboratory examining samples obtained roughly two weeks apart, found 3 pesticides in each case; however, only one was found in both samples. This particular sump was sampled at the end of a dry summer season and is in soil at the bank of the Niagara River. It seems implausible that the pesticide concentrations in the sump changed as rapidly as indicated.

Table 9 on the significant differences observed in the extent of sump water contamination bases its statistical comparison of the Emergency Declaration Area to the Control Area on a single independent control sample. It would appear that in actuality there is no valid basis for comparison.

2. Sewer Samples:

As indicated in the Appendix B Control Site listing, no single site was used for each category of sample. The number of control sites represented varied from 15 for bedrock water samples to one each for sump water and for storm sewer water and sediment. The highest level of contamination of dioxin was found in sumps near the canal and the storm sewers draining that area. The comparisons between the extent of contamination of storm sewers and sumps in the Emergency Declaration Area and the control sites was made on a basis of a single control site for each.

Further, in spite of the fact that homes in this area often have sump pump and rain water connection to the sanitary sewer, not a single sanitary sewer sample was taken as a control, nor were there any air samples taken for basements outside or sump/air controls. (Table 2 pg. 14).

Parenthetically, the drinking water samples are all obtained from the same water system and a comparison seems to be irrelevant.

3. River Samples:

For a control sample to be usable, it should be both representative and reproducible. The surface water samples were taken as single samples at 5 different locations; therefore, there are five independent samples. However, the majority of the sites sampled are not representative because the locations are known, even in 1979 to be contaminated by industrial waste.

The critical significance of this fact rests with the EPA pronouncement that habitability statements are presented in terms of a comparison between the Emergency Declaration Area and Control Areas. Pages 38-39 of the report state, "special attention was given to selecting control site locations in the Niagara Falls area that were not influenced directly by Love Canal or any other known hazardous waste sites. (Emphasis ours) The control sites were monitored to determine normal pollutant levels found near to (but not influenced by) Love Canal". In reality, the control area does not correspond to a single desirable residential area, but rather to a number of scattered sites.

The report itself acknowledges on page 123 that the Niagara River at the 102nd. Street landfill and Cayuga Creek have contaminated sediments. In fact, the Niagara River at 102nd. Street is the subject of federal litigation at the present time. The location at Fish Creek is near a waste disposal site identified in the 1979 Inter-Agency Task Force Report.

Black Creek and Bergholtz Creek were sampled upstream of known contaminated outfalls. As stated in the EPA Report on page 54, "Given the existance of certain climate and weather-related conditions and the gentle slopes of the three creekbeds, local and temporary reversale of water flow direction are known to occur in Cayuga, Bergholtz, and Black Creek". New York State

DEC officials believe that much of the sediment transport in the Niagara River Basin occurs during storm episodes. Therefore, there is a possibility that these sites are also contaminated by the Love Canal.

We conclude that all of the stream sampling sites are suspect as being representative locations and most should be rejected in advance because of the known contamination. There are of course streams on Grand Island and other waterways in Canada which could have been used as controls.

4. Well Samples:

In addition, there were 11 shallow wells and 15 bedrock wells used for controls. Some wells are apparently near known landfills, for example Jayne Park is on Cayuga Island which has land filled areas. Griffon Park is a land filled site. Williams Road near the Robert Moses Parkway is also near the Lynch Park Landfill at Williams and River Road. We are not implying that materials from these landfills have been detected in the wells, only that the choice of these sites as control sites obviously does not meet the stated site selection criteria.

The critical nature of these observations relating to choice of control sites rests with the overridingly significant conclusion of the July 13, 1982 HHS communication Further Considerations Concerning

Habitability, specifically "...the Love Canal area, outside Area II, is as habitable as the control areas with which it was compared."

One additional observation concerning EPA testing procedures relates to the presentation of Dr. Peter E. Voytek (Reproductive Effects Assessment Group, EPA) at the June, 1981, symposium on "Assessment of Health Effects at Chemical Disposal Sites" held at Rockefeller University. In his address, he stated, "Another possibility is to determine exposure levels at a waste site and compare these with concentrations at another area in the region in which all exposure factors (population distribution, water quality, etc.) are the same with the only major difference being the presence of the dump site. By comparing the different chemical exposures, it is conceivable that a qualitative statement can be made stating 'for the chemicals monitored, the people in the area of the disposal site are no more at risk, are at slightly higher risk, or are at a higher risk than people at a matched control site'. The definition of what represents a matched control site certainly would be controversial."

Apparently, there was a change of strategy between the original plan and the final document released on July 14, 1982. In the original plan "matched control sites" were not a major concern, and control data was given a relatively low priority. Dr. Voytek outlines this earlier strategy: "For Love Canal, the source is site-specific. The exposure pathways were thought to be through air, attenuation through soil, and transport via surface and ground water. In order to measure the concentrations of the selected chemicals, an extensive monitoring plan was developed by EPA. Volatile organics in air samples were measured using Tenax sorbent cartridges, and pesticides and related compounds using polyurethane foam plugs. Water samples were analyzed by standard separation techniques differentiating between volatiles, basic/neutral/acidic semivolatiles, and inorganics. Soil, sediment, and water samples were separated in similar fachion. Mice, crayfish, and worms, as well as other biota, were analyzed to search for chemicals that bioaccumulate. To further distinguish the exposed populations, the area around Love Canal was separated into strata. "Hot spots" or areas of "high" concentration were looked for. Estimation of whole-body dose (the amount of chemicals taken into body tissues) is being attempted, using models that consider standard absorption factors for lungs, dermal tissue, and the gastrointestinal tract. All these findings will be used in conjunction with animal toxicity studies to estimate potential human risk. About one-half million data points were taken on 150 chemicals at Love Canal. The results of this study are being analyzed and are scheduled to be released by EPA soon."

The results of the exposure analysis study have not been released in the year following Dr. Voytek's symposium appearance.

IV. RELATED POLICIES OF LAW

Honest questions about the validity of the EPA data base and control groups, skepticism over the hasty July 13, 1982 habitability estimate, sound disagreements among the eleven member Scientific Panel lead to the posing of a critical question, critical to all those fathers and mothers and children who will elect to revitalize the Love Canal area. Exactly, how is their legal and ethical right to initiate possible legal action in the future, not only protected, but actually provided for. Given the life and death significance of the CDC and HHS phrase "constantly safeguarded", will residents retain their unalienable right to initiate litigation should future developments warrant such.

We know that at present, the signing of a waiver relinquishing such right has been proposed by the Love Canal Revitalization Agency. The mandated signing of such a waiver by the citizen buying a Love Canal home would effectively separate him from his fellow citizens in Niagara Falls, in New York State, indeed in the United States itself.

The right to sue, resting as it does in common law, historically allows the citizen to initiate legal action for personal or property damage unless that person agrees in advance to relinquish such right. Given the profound health uncertainties, echoed by critical disagreements among conscientious scientists and medical professionals, it is both unconscionable and unethical to demand the signing of such a waiver as condition for the purchasing of these homes. What is, in effect, the veritable signing away of his birthright, may well condemn these new Love Canal homeowners to future years of extraordinary expense, legal maneuvering and human suffering as they attempt to recapture what they have signed away in this precedent setting action. To demand such a waiver as condition of sale should be illegal as a matter of public policy and we therefore respectfully ask members of Congress to investigate precisely what this proposed waiver will require of U.S. citizens.

We are mindful that in the only legal settlement reached between government and the local Niagara Falls industry responsible for our chemical contamination, namely the Hyde Park suit and its subsequent Agreement, residents are to sign such a lifetime waiver, a release against any future claims for loss or damages. And therefore, the question needs to be raised, if a warranty is demanded in buying a used car, should not the same be true in buying the future health and safety of a family. Undoubtedly, the analogy weakens when we compare the value of a purchased piece of steel with the value of human life. But are we, in effect being told by EPA, "Buy it, trust us, you'll love it," when in reality, there is no warranty, when the dealer admittedly still has some work to do on it, when his own mechanics are of different opinions about the wisdom of owning it and when the dealer himself still won't state it's safe to drive. You wouldn't buy a car under such circumstances. Would you buy a home under those same circumstances, even if the deal were made financially attractive in our economically depressed area. Mr. Morris, Executive Director of the Love Canal Revitalization Agency, has stated publicly, "The advantages of buying Love Canal homes will be in a yet unspecified break on mortgages, down payments and interest rates."

The policy of dangling this financial apple before the public, shrouded as it is by unanswered scientific and medical questions, while at the same time, demanding the buyer's signature on a waiver relinquishing his natural right of redress, is unethical, deplorable, and should be, illegal. In short, if it's as habitable as EPA says it is, why is a waiver even being considered?

CONCLUSION

We, the Ecumenical Task Force of the Niagara Frontier, have submitted this testimony out of a moral imperative; it is not only our right, but our duty to take the initiative in acting in such a manner. It has been our approach throughout this time of ordeal in the Love Canal crisis to speak for those who have been denied the opportunity of participating in a critical situation in which they find themselves.

Our speaking out is not only for those who have chosen to leave their homes and can now feel assured that they made a right and proper decision, but for those who have remained in the area, and even more for those families who must make the decision on whether to move in and for those in other communities faced with similar problems. Ours may be viewed by some in the bureaucratic and political arena to be counter-productive; our reply is that education has always been a subversive force and prophetic voices suspect.

It is not enough that people must accept and adjust to what has been discovered, uncovered, hidden at Love Canal, but that it is a situation which must be worked on and solved. To do less than that given the vast resources and talents of the scientific and political communities, would be dehumanizing.

We believe that people are capable of looking critically at the evidence, the lack of evidence, or the blunting of evidence (data) which has been complied by the Environmental Protection Agency. We, therefore, have urged in our testimony that they be given the proper tools to do so. For example, it has been the purpose of our testimony to underline the fact that EPA is not responsive to many critical recommendations of the scientists who reviewed the data on the habitability issue. E.D. Pellizzari, Ph.D., Director for Analytical Sciences Division, Research Triangle Institute says, "Perhaps each (emphasis ours) location (household) in the declaration area should be individually evaluated."

Richard T. Dewling, Ph.D., P.E., Deputy Regional Administrator, EPA New York, who reported the EPA Love Canal study in Niagara Falls on July 14, 1982 persists in telling the public that all the information they need is in Environmental Monitoring At Love Canal Volume I, when in fact, to really understand the information, Volume II (Part 1), Volume II (Part 2) and Volume III, and Environmental Monitoring At Love Canal Interagency Review, are imperative. It is in a thorough and professional examination of these Volumes that criticism is justified. It remains our contention that to have only published 100 of these volumes on so weighty a matter with consequences far into the future, is a withholding of information akin to criminal negligence.

As we write this, Federal Officials, as a condition to saying the area is "habitable" (never do they use the word safe) caution that it must be continually and intensively monitored to ensure that the containment devices work. They also say, "aside from any future improvement in technology that may enable these wastes to be rendered innocuous, we doubt that continued leachate collection over a period of many years will reduce contaminants in the leachate from Love Canal to harmless concentrations." (Buffalo Evening News, August 12, 1981, page B-7). State Officials responsible for new capping and construction on the Love Canal are now advising city officials that, "It will not be prudent to move people back into areas near the old dump and near Black and Bergholtz Creeks while construction is underway." (ibid) This is all too reminicent of 1978-79!

Therefore, the critical nature and significance of the unresolved scientific and medical questions raised by the EPA Love Canal Study demand that an independent and scientific review be undertaken with its findings published and readily available to the concerned public. Accordingly, we have made arrangements for such a review. A partial list of these reviewers is as follows:

James R. Allen, Ph.D., Environmental Pathologist and Toxicologist. Director J. R. Allen Associates, Inc., Mars Hill, N.C.

Grant Anderson, B.Sc., P.Eng., Consulting Hydrogeologist. Gartner Lee Associates Limited, Toronto, Ontario, Canada.

Rosalie Bertell, G.N.S.H., Ph.D., Director, Ministry of Concern for Public Health, Buffalo, N.Y.

William Boeck, Ph.D., Professor of Physics, Niagara University, New York.

Irwin J. Bross, Ph.D., Director of Biostatistics, Roswell Park Memorial Institute, Buffalo, N.Y.

Thomas A. Cahill, M.C.P., Architect/City Planner, Principal, The Planners Studio, Newton, MA.

Barry Commoner, Ph.D., Director, Center for The Biology of Natural Systems, Queens College, Flushing, N.Y.

Richard J. Cook, Ph.D., Chair, Department of Chemistry, Kalamazoo College, Kalamazoo, Mich.

James A. Dunlop, MD, Pediatric Medicine, Grand Island, N.Y.

Stephen E. Dudley, MD, Physician/Surgeon, Lake City, Minn.

Douglas J. Hallett, Ph.D., Senior Advisor, Scientific Programs, Ontario Region, Federal Department of Environment

John L. Kieffer, S.J., D.Sc., P.E., Consultant, Chemical and Environmental Engineering, Niagara Falls, N.Y.

Edward Kleppinger, Ph.D., Consultant, Environmental Management, Washington, D.C.

Duane G. Ollendick, Ph.D., Consulting Psychologist, Zumbro Valley Mental Health Center, Rochester, Minn.

C. W. Shonnard, P.E., Consultant, Environmental Engineering, Lewiston, N.Y.

George Wald, Ph.D., Nobel Laureat Biologist, Higgins Professor of Biology Emeritus at Harvard University.

In keeping with the mandate that we share with you, members of this committee, to seek after the truth, we would hope to be in future dialogue with you. Thank you for your concern and the opportunity to present our testimony.

Love Canal Homeowners Association

DATE: July 30, 1982

TO: Senators of Environmental and Public Works Committee

FROM: Lois Marie Gibbs, President Love Canal Homeowners Association LMG

RE: EPA-Love Canal Monitoring Program

Enclosed are our comments on the EPA-Love Canal Monitoring Program. These comments highlight six issues which include: the setting of Backdoor Standards; The Conclusion of "Habitability" Being a Political Decision Not Supported by the Data; The Quality Assurance of the EPA-Love Canal Study; The Use of Control or Comparison Groups; The Ability of the EPA-Love Canal Study to Answer Questions of Health and Habitability; and Predictability of the Current Contamination Picture for the Future.

Although we outline six issues which we feel should be addressed at the hearing, I have attached the Love Canal Homeowners Association's comments of July 14, 1982 which further discusses these issues in more detail and raises other concerns and questions that reflect on the "habitability" statement of Love Canal.

I hope these comments will be helpful to you in preparation of your hearing. As I discussed with Jo Cooper, I will be submitting testimony for the record which will be finalized after the hearing. If I can provide you with additional information or if I can assist you in other ways, do not hesitate to contact me at (703) 532-6816. I would like to thank you for your concerns and efforts in bringing the questions of the "habitability" to the public's attention.

Backdoor Standards

The most significant impact of the conclusion of habitability of the Love Canal area is the setting of "backdoor" standards of acceptable environmental contamination levels. The implications are nationwide, affecting all sites wherever contamination exists, particularly at waste sites where clean up ("Superfund") is being considered. By saying that the levels of contamination found at Love Canal do not influence the habitability of the area, those levels in essence become standards by which other contamination problems will be judged. Areas where groundwater and soil contamination levels similar to those found at Love Canal will not get Superfund money and will not get the attention necessary to assess potential health risks. Already, residents in Fullerton, California were denied an opportunity to have their health surveyed by the State Health Department because their air levels were similar to those found at Love Canal. This decision was made despite a preliminary survey which discovered numerous miscarriages, birth defects and other reproductive problems amongst the residents.

The far reaching conclusion of habitability cannot be justified on the basis of the data generated in the EPA-Love Canal Study. Certainly, no scientist would ever establish environmental standards using methods flawed and controversial as those used by EPA and CDC. Habitability is a measure of implied safety that every toxicologist knows simply cannot be proven scientifically. EPA is attempting to prove safety can be "proven" politically. The thousands, maybe hundreds of thousands of people across the country whose health will be affected by contamination left unaddressed are the victims of this decision.

The Conclusion of "Habitability" is a Political Decision Not Supported by the Data

We have to ask the question, was the decision to declare the Love Canal area habitable a scientific decision based on hard science and scientific opinions, or a political decision? Looking at the chronological events from October, 1981 until June 28, 1982, the conclusions of HHS, CDC and NBS were that no conclusions can be drawn from the environmental sampling data.

Then on June 28, 1982 NBS received additional data from EPA and was suddenly asked questions different from those originally posed by CDC and EPA. CDC and EPA wanted a "general characterization" of the study "rather than comments on particular issues" as originally assigned by EPA. However, NBS was "not able to provide a general characterization of the EPA Study."

On July 9th, NBS, having received EPA's "new" data on methods to establish detection limits, assessed the approach as "reasonable" (far from a firm statement), but also gives three provisos. NBS also states in this letter that all their original comments stand and that the additional comments "supplement but not replace" the original review.

July 13th (four days later) CDC and HHS publicly declared that Love Canal was habitable. In one month's time, after receiving pages of criticisms of the EPA Study from eleven independent expert consultants and NBS on the procedures, methodologies, controls and more, suddenly CDC and HHS changed their minds. The new data supplied by EPA was certainly not strong enough to dismiss all of the major flaws in this study.

Why then did HHS and CDC change their minds? Why was NBS suddenly asked to answer different questions than the ones originally posed? What was the "additional" data the NBS received from EPA on June 28th? Did it really influence NBS in anyway or did EPA simply restate what they wanted NBS to comment on? Why were consultants invited to review and comment on the report when their comments were not taken seriously or addressed? Were NBS and the consultants used to "window dress" the study? Has the administration used "strong-armed tactics" to get the Love Canal "white elephant" off their backs? Or, is the White House concerned (as they were during the Carter Administration) about the impact a "not habitable statement" would have across the country? After all, if Love Canal is not habitable, is Woburn, Massachusetts; Jackson Township, New Jersey; Smithfield, Rhode Island, and so on?

Quality Assurance of the EPA-Love Canal Study

Meaningful interpretation of the data generated in the EPA-Love Canal Study is dependent upon the quality of the data. It was the expert opinion of the National Bureau of Standards (NBS) review committee that EPA relied upon to judge the quality of this data based on the study design, the analytical methods used and the performance of the labs in carrying out these methods. In a detailed review of the EPA-Love Canal report, NBS identified numerous technical deficiences and limitations in the data (NBS report pp. 4-9), repeatedly emphasizing the lack of consistency and confidence in the data due to the failure to adequately address the limits of detection:

> "EPA has not incorporated estimates of precision, accuracy and limits of detection into its validated data base. Unless measured values, including none detected, are accompanied by estimates of uncertainty, they are incomplete and of limited usefulness for further interpretation and for drawing conclusions." (NBS report, p. 5)

Although many difficulties in quality control are discussed by NBS, the critical component is the variability in the reporting of limits of detection among laboratories The limits of detection define the sensitivity, or ability of a testing procedure to detect the presence of a substance. Current laboratory instruments are very sensitive and variable. One lab may have a limit of 100 ppb and another 50 ppb. If a resident's soil sample contains 50 ppb and it is sent to the first lab for analysis, the results will show nothing. If it goes to the second lab, a positive finding will be reported. Consequently, in order to compare the data in a meaningful way, each lab must establish equivalent detection limits for the same compounds. As described by NBS, EPA did not do this:

> "The significance of the limits of detection and quantitation and how these limits might affect the conclusions drawn from the study were not adequately considered." (NBS report, p. 6)

A total of thirteen different laboratories contributed to the analysis of the samples collected at Love Canal. No consistent procedures for selecting limits of detection were applied in this study. Limits of detection varied as much as 250 fold among laboratories with many values greater than 100 fold (Draft report, pp. 168-178).

For example, one lab had a detection limit in soil for vinyl chloride of 100 ppb while another was 20 ppb and a third 1 ppb; pentachlorophenol had detection limits in water that varied from 1 to 75 ppb for three labs. This variability means that comparisons of data analyzed by different labs is inappropriate and invalid.

The importance of this variability in detection limits is that the conclusions drawn from the data can be markedly influenced and even altered unless appropriate comparisons are made. NBS criticizes EPA for not addressing this critical factor:

> "Because the conclusions of the study rest on comparisons of the frequency of compound detection, the values obtained for the limits of detection of individual substances can influence significantly such conclusions." (NBS report, p. 8)

An example may help:

> Lab A has limit of detection of 100 ppb
> Lab B has limit of detection of 20 ppb
>
> 50 samples were collected: 10 from a control area
> 40 from the declaration area
>
> The control area samples are sent to Lab B.
> The declaration area samples are sent to Lab A.
>
> Lab A reports that only three samples were greater than 100 ppb. The frequency of detection is 15%.
> Lab B reports that only one sample had concentrations greater than 20 ppb. The frequency of detection is 10%.

Based on this example EPA would conclude that there is no difference in contamination levels between control and the declaration area. However, since Lab A and Lab B do not have equivalent limits of detection (Lab B is five times lower than Lab A), positive readings between 0-100 ppb are not reported by Lab A. Since EPA did not know the limits for each lab in many instances (NBS report, pp 8-9), comparisons are inappropriate and conclusions scientifically unjustifiable:

> "Unless measured values, including "none detected," are accompanied by estimates of uncertainty, they are incomplete and of limited usefulness for further interpretation and for drawing conclusions." (NBS report, p. 9)

The Use of Control or Comparison of Groups

The selection of controls and the number of control samples reflect poor scientifi planning and methods. This has resulted in the use of control groups to compare with the declaration area that are scientifically inappropriate and unjustifiable. The reasons for this follow.

First, the basis for selection of the controls is limited solely to areas "not influenced by Love Canal" without concern for other factors. No description of the controls was provided which raises the question of whether EPA considered the location of these control sites relevant to other pollution sources such as a hazardous dump sit or airborn pollution problems (Aust, p. 1; Paigen, p. 2; Highland, p. 5). As described by Paigen, who is familiar with the Niagara Falls area, one of the controls, "Packard Avenue may be near another dump site" (Paigen, p. 2). Furthermore, since there is no description of which control data come from which control site, it is possible that the minimal levels of contamination that are reported in the controls are the result of this source (Highland comments, pp. 6-7).

The second deficiency in the use of the controls results from the small number of samples collected from controls as compared to those collected in the declaration area. For example, 121 soil samples were taken, 113 in the declaration area and 8 in the controls; 79 groundwater samples were taken, 68 in the declaration area and 8 in the controls; 111 sump samples were taken, 105 in the declaration area and 6 in the controls. This imbalance in sampling greatly reduces the sensitivity or ability to detect differences between controls and the study area. Dr. Joseph Highland discusses this problem:

> "The ratio of samples obtained from the test area (areas 1 through 11) to the control area (number 99) suggests that the sampling pattern heavily favored the collection of samples from within the Love Canal area. While I am not a statistician, I believe a skewing of sample selection so heavily toward the experimental neighborhood may make the study relatively insensitive compared to a study where a better balance between the control area is

> achieved. In further discussion of this data, I would like an analysis by a statistician as to the significance of the effect of the sampling pattern on sensitivity of the study (Highland comments, p. 6)."

As a result of these deficiences, interpretation made by comparing the study area with the controls is inappropriate and any conclusions drawn are scientifically invalid.

The following questions are raised: Why did EPA not balance sampling between these groups more closely? When were the control samples collected relative to the study area samples? Why did EPA draw conclusions from the comparisons of these groups when the sensitivity of detecting differences was so low (see recent EDF comments)? Why did EPA fail to determine the satistical "power" or sensitivity of the two comparison groups? Why did EPA not elicit the expert opinion of a reputable statistician to do this?

Ability of the Studies to Answer Questions of Health and Habitability

The original purpose of the monitoring program was to assess the health impact and risks of the residents of Love Canal. A series of health studies were to have been carried out in conjunction with the environmental monitoring program. Unfortunately, the proposed health studies were abandoned leaving only the monitoring data to assess the health and habitability of the Love Canal. This single study is severely inadequate to address the habitability of Love Canal. For this reason, CDC and HHS should have taken into consideration, when making their habitability decision, all existing health and environmental studies conducted at Love Canal. This is especially true in the absence of "reliable data," as occurs with EPA-Love Canal data, thus limiting the interpretations and conclusions that can be drawn from the data. NBS clearly describes this in their 7/9/82 letter:

> "You (EPA) and CDC have asked if NBS endorses the statement that the NBS review did not identify any problems that would affect the conclusions of the monitoring program. NBS cannot comment on the significance of the problems that NBS has identified to the conclusions of the EPA report because such an evaluation requires knowledge of health effects and

mechanisms of chemical migration and degradation in addition to knowledge of chemical analysis."

There are many additional studies conducted by EPA, New York State Health Department (DOH) and New York State Department of Environmental Conservation (DEC) which were brought up briefly for discussion but never seriously considered. These studies include:

- DOH studies on pregnancy outcomes on which two health emergency evacuation orders were based, August, 1978; February, 1979;
- EPA Carcinogen Assessment Group (CAG) which estimated cancer risks based on environmental sampling in the Love Canal area, November, 1979;
- EPA Chromosome Study, May, 1980;
- DOH Cancer Study, June, 1981.

(These studies are more fully described in Appendix #1 of the attached LCHA comments.)

Why were these studies dismissed and ignored?

The eleven consultants were also invited to review the data and comment on it and their comments were also ignored and not taken seriously. For example,

- Four consultants believed the Love Canal was more contaminated than other areas studied,
- Three consultants flatly said the area was not habitable,
- Three consultants were not sure the area was habitable,
- Two said it was habitable only if they could be assured that the toxic materials would be contained far into the future.

The majority of the consultants either said the area is not habitable or could not make a conclusion based on the data presented.

In addition to these problems, there are other limitations in interpreting the data relative to habitability, including:

- Only a small portion of the chemicals identified at Love Canal were measured;
- The samples collected do not fully represent the community with many known

contaminated homes omitted;

- The monitoring study was a one-time "picture" of contamination that does not consider changes over time;
- The human health effects caused by chronic low-level exposures to a combination of many toxic chemicals is not known;
- The toxicity of many of the chemicals found at Love Canal is not known;
- The levels at which toxic effects occur in people is not known.

These limitations are described in more detail in the attached LCHA comments.

There are also no residential standards for organic chemicals, typical of those found at Love Canal, in air, groundwater or soil. In the absence of such standards, the only way to assess the health risks is by estimating the chemical exposures to residents in the community (see Tardiff comments). This project has, in fact, begun by EPA through a consulting firm (Clement Associates), but has yet to be completed. The logic of making a habitability statement, at this time, without this additional vital information completed is not rational. The risk assessment could alter the conclusions of habitability causing potential public embarrassment and retraction of the original conclusions. Why did EPA not wait for this study? Did EPA abandon this assessment? Was Clement Associates able to conduct its assessment using the data?

How Predictive is the Current Contamination Picture for the Future?

The application (and significance) of the existing data to predict future habitability of the Love Canal area was seriously questioned and challenged by several of the expert health consultants (Highland, Doull, Pellizzari, and Paigen). The basis of these concerns was the ability of the remedial containment system to contain the wastes. Without a monitoring program to measure the effectiveness of the containment system (none exists), no rational (or supportable) statements on future habitability can be made.

EPA, on the other hand, states that "the clay cap and barrier drain system installed around the former canal has been working as designed. The outward flow of chemicals has been stopped. Near-surface groundwater flow has been reversed back into the drains." (EPA News Release 7/14/82)

EPA makes this statement without any field monitoring data, using instead a hydrogeological model to predict movement. In addition, EPA does not know what chemicals were found at Love Canal prior to the construction, although volumes of data are available from DEC. Therefore, to draw a conclusion that the drainage system is working based on a model is totally inadequate.

This is especially true in light of the fact that people living in Love Canal may be exposed to contamination if the system does not work as EPA's model predicts, in other words, if the containment system fails. Furthermore, the ability of the clay cap to prevent infiltration of water into the canal and volatilization of chemicals out of the canal without long-term maintenance (none is planned) is very questionable. First, there are no funds appropriated for long-term maintenance of the cap. Second, Dr. Steven Kim, one time director of the New York State DOH, Division of Toxicity, was mentioned in Dr. Highlands comments as reporting "that when cracks developed in the current cap prior to sodding, one could detect the escape of volatile organic chemicals."

Additional evidence that this containment system is not working include: the finding of contamination in the bedrock aquifer and the finding of dioxin in sumps of homes immediately adjacent to the canal in July, 1981 (6 months after the completion of the EPA-Love Canal Study) by the New York State DOH.

These findings and the lack of monitoring to measure the effectiveness of the containment are sufficient basis to preclude conclusions on habitability. A contrary decision raises questions such as: What mechanism will detect or measure a failure in the existing containment system? What specific evidence exists to show that the system is working (see contrary evidence above)? What precautions are being taken to ensure against failure of the clay cap? Who will pay for any such measures (no money is currently set aside for any monitoring or maintenance)? What evidence exists that continuing exposure to current levels over the course of a lifetime are not injurious to people?

MAY 1982

ENVIRONMENTAL MONITORING
AT
LOVE CANAL
INTERAGENCY REVIEW

Comments by:

U.S. Department of Health and Human Services
National Bureau of Standards
U.S. Environmental Protection Agency

Office of Research and Development
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

FOREWORD

In view of the long-standing involvement of the Department of Health and Human Services (HHS) in activities at Love Canal, that Department prepared the enclosed report "HHS Evaluation of Results of Environmental Chemical Testing Performed by EPA in the Vicinity of Love Canal, Implications for Human Health". Included are individual comments by the scientists and physicians who participated in the HHS evaluation, and copies of communications between EPA and HHS.

In the fall of 1981 EPA requested the National Bureau of Standards (NBS) to review the EPA program directed to organic chemicals, with particular attention to the analytical methods and quality assurance procedures which were adopted. In response, NBS prepared the enlosed report "Review of Material Provided by EPA in the Analysis for Organic Chemicals in the EPA Love Canal Monitoring Study," dated May 10, 1982. Copies of communications between NBS and EPA are also included.

Since the NBS Review raised a number of analytical questions, EPA subsequently prepared the enclosed response, "EPA Observations on the Review of the National Bureau of Standards of the Love Canal Monitoring Program."

Courtney Riordan
Acting Assistant Administrator
for Reserach and Development

HHS EVALUATION OF RESULTS OF ENVIRONMENTAL CHEMICAL TESTING PERFORMED BY EPA IN THE VICINITY OF LOVE CANAL

IMPLICATIONS FOR HUMAN HEALTH

FURTHER CONSIDERATIONS CONCERNING HABITABILITY

For CDC:

Clark W. Heath, Jr., M.D.
Renate D. Kimbrough, M.D.
John A. Liddle, Ph.D.

For NIEHS:

David P. Rall, M.D., Ph.D.
Walter J. Rogan, M.D.

JULY 13, 1982

Transmittal letter
signed and dated
7/13/82 by
James Dickson, III, M.D.

On May 12, 1982, the National Bureau of Standards (NBS) made available to the Department of Health and Human Services (HHS) its assessment of the Environmental Protection Agency's (EPA) Love Canal Monitoring project. We reviewed this assessment and pointed out (June 14, 1982) that our earlier statement about habitability of the Love Canal area was predicated on adequate chemical methodology: "Should the NBS review suggest methodologic difficulties in the EPA data set, the health evaluations presented here would require reassessment" (HHS, October 7, 1981). Since the May 12 NBS assessment implied that EPA's technical methods might be inadequate in the area of method detection limits, we felt compelled to withhold judgment about habitability.

Since that time, additional information was provided to HHS by EPA on July 9, 1982, regarding reliability of method detection limits and recovery data for organic compounds measured in environmental specimens from the Love Canal area. EPA assures that levels previously designated as "trace" or "not detected" are most unlikely to have exceeded values in the low parts per billion (ppb) range and in no case would represent a value greater than 1 part per million. We judge that levels of organic chemicals in the low ppb range present minimal health risk, except in the case of TCDD for which levels in the ppb range are clearly of toxicologic significance and which has been identified in storm sewers and related outflow streams in the Love Canal area.

In the meantime, NBS has continued its examination of the technical methods used by EPA in developing the data. Based on the findings of this further review (in part arising from additional information provided by EPA to NBS on June 28, 1982), NBS has indicated by letter to EPA on July 9, 1982, that "the methods of analysis used by EPA for water, soil and sediments, and air are generally acceptable methods and represent the state of the art." We assume the provisos on this statement from NBS can be met by EPA.

In view of the further information from EPA and of the most recent NBS opinion regarding the methods used by EPA, we feel that the statement concerning habitability of the Love Canal area, as expressed in the HHS evaluation dated October 7, 1981, is accurate. In that evaluation, we stated that "the Love Canal area, outside Area 11, is as habitable as the control areas with which it was compared." Again, as stated in that document, this judgment regarding habitability includes the requirements that Area 11 (the Canal site itself and the land occupied by the two rings of homes surrounding it) be constantly safeguarded against future leakage from the Canal and that cleanup is required for existing contamination of local storm sewers and their drainage tracts.

J.W.H.
L.S.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Office of the Assistant Secretary
for Health
Washington DC 20201

[illegible] 15 1982

John W. Hernandez, Jr., Ph.D.
Deputy Administrator
Environmental Protection Agency
401 "M" Street, S.W.
Washington, D.C. 20460

Dear Dr. Hernandez:

I am sending you a modification of the September 18, 1981, Department of Health and Human Services (HHS) evaluation of the health implications of the Environmental Protection Agency (EPA) environmental monitoring at Love Canal. The HHS scientists modified their earlier report after carefully considering the National Bureau of Standards review of the environmental monitoring program.

Since the modification represents a significant change in the tentative conclusions drawn by HHS in the earlier review, I am asking that it be attached to the document I sent to you on November 18, 1981.

We will also continue to work with you and Dr. Dewling, your coordinator for the final preparation and release of the EPA final report, to help interpret our findings to the citizens and other interested parties.

As I stated in my last letter, I believe it is important for the Department of Health and Human Services to review EPA's final report and press release before these documents are made public.

Sincerely yours,

Edward N. Brandt, Jr., M.D.
Assistant Secretary for Health

Enclosures

HHS EVALUATION OF RESULTS OF ENVIRONMENTAL CHEMICAL TESTING PERFORMED BY EPA IN THE VICINITY OF LOVE CANAL

IMPLICATIONS FOR HUMAN HEALTH

MODIFICATION OF THE REPORT OF
SEPTEMBER 15, 1981

For CDC:	Clark W. Heath, Jr., M.D. Renate D. Kimbrough, M.D. John A. Liddle, Ph.D.
For NIEHS:	David P. Rall, M.D., Ph.D. Terri Damstra, Ph.D. Walter J. Rogan, M.D. James D. McKinney, Ph.D.

June 14, 1982

In September 1981, we prepared a report evaluating the human health implications of the environmental chemical testing performed by the Environmental Protection Agency (EPA) in the Love Canal area during the summer and fall of 1980. In that report we indicated that our evaluation rested "on the assumption that the methods used by EPA in collecting, storing, and testing specimens were satisfactory." The evaluation of the adequacy and appropriateness of the methods used by EPA has been independently reviewed by the National Bureau of Standards (NBS). The final NBS report regarding the conclusions of that review, together with a revised draft of EPA's detailed report on the total study, were made available to us by EPA on 12 May 1982. In view of the criticisms and concerns expressed in the NBS report, we must modify the tentative conclusions expressed in our earlier report.

The NBS review concludes that EPA did not adequately address the problems of limits of detection and sensitivity of the analytical methods used. In the instances where EPA detected contamination, it is reasonable to conclude that chemicals were present. However, in the instances where EPA reports the absence of contamination (about 90 percent of the values reported), no strict quantitative interpretation is possible, and judgments about the habitability of the area cannot be based on these values. Thus, with the data now available to us, no definite recommendations or conclusions as to the habitability or the potential human health risks of the Love Canal area can be made. The conclusions about the necessity for clean-up of areas shown by EPA to be contaminated still stand.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Office of the Assistant Secretary
for Health
Washington DC 20201

[illegible] 13 1981

John W. Hernandez, Jr., Ph.D.
Deputy Administrator
Environmental Protection Agency
401 "M" Street, SW
Washington, D.C. 20460

Dear Dr. Hernandez:

I am pleased to send you the report of the Department of Health and Human Services, including all comments provided by outside consultants, regarding the health implications of the environmental chemical testing conducted by the Environmental Protection Agency (EPA) in the Love Canal neighborhood in Niagara Falls, New York.

Our evaluation focused on the potential for adverse health effects resulting from exposure to the levels of chemicals identified in the EPA environmental monitoring project. The sampling plan and analytic procedures were not reviewed.

Please let me know when and how you plan to convey the findings of the EPA testing to the Love Canal area residents so that we can ensure that our evaluation is released simultaneously.

I look forward to continuing our mutually cooperative efforts to respond to these difficult environmental and public health issues.

Sincerely yours,

E. N. Brandt, Jr.
Edward N. Brandt, Jr., M.D.
Assistant Secretary for Health

Enclosure

HHS EVALUATION OF RESULTS OF ENVIRONMENTAL CHEMICAL TESTING PERFORMED BY EPA IN THE VICINITY OF LOVE CANAL

IMPLICATIONS FOR HUMAN HEALTH

For CDC:
Clark W. Heath, Jr., M.D.
Renate Kimbrough, M.D.
John Liddle, Ph.D.

For NIEHS:
David P. Rall, M.D., Ph.D.
Terri Damstra, Ph.D.
Walter Rogan, M.D.

October 7, 1981

In the summer and fall of 1980, the Environmental Protection Agency (EPA) performed extensive environmental chemical testing in the vicinity of Love Canal and in comparison areas in Niagara Falls, New York. In the summer of 1981, the Department of Health and Human Services (HHS) agreed to provide EPA with an independent evaluation of the results of those tests with respect to their implications for human health (Appendix A). The HHS review, conducted by the Centers for Disease Control (CDC) and the National Institute for Environmental Health Sciences (NIEHS) of the National Institutes of Health, made use of written opinions provided by 11 non-federal expert consultants, 10 of whom met at CDC in Atlanta on August 13, 1981, to discuss the EPA data. Prior to the meeting, the consultants were provided with the EPA data in condensed form. The letter from CDC which transmitted these data (Appendix B) asked that each consultant review the data with respect to four particular questions:

1. Are the concentrations measured significantly different from levels found in other areas of Niagara Falls?
2. Do the levels measured represent concentrations that could cause acute or chronic adverse health effects in people living in the Love Canal area beyond what might be expected under usual residential conditions in the Niagara Falls area?
3. Were sufficient samples taken and analyzed to determine the extent of contamination by particularly hazardous materials and to be able to assess their potential threat to human health?
4. Based on available data, can you conclude that the area is not habitable?

Presented below are responses by HHS to these four questions, taking into account the written reports of the 11 consultants (Appendix C) and preceded by a discussion of certain general considerations.

A. General Comments

1. Format of the EPA Report. The results of the EPA testing have not yet been assembled in comprehensive, concise format suitable for standard scientific publication. The present review was conducted using computer printouts of test results. This was done so as not to delay the health assessment of test results and so that consultants would have the opportunity to weigh the data without prior interpretation or analysis. Since the great bulk of testing (over 90 percent of the more than 400,000 measurements) found no detectable or only trace amounts of chemicals, HHS opted to have EPA condense the data for review into a format focusing primarily on those test results which had yielded finite values. However, conclusions presented here regarding these data may need to be reevaluated when EPA presents the data in full scientific format.

2. Methodology of Chemical Testing. The evaluation of data provided here is made on the assumption that the methods used by EPA in collecting, storing, and testing specimens were satisfactory. Independent review of these aspects of the data is currently being performed for EPA by the National Bureau of Standards (NBS). Should the NBS review suggest methodologic deficiencies in the EPA data set, the health evaluations presented here would require reassessment.

3. Consultant Opinions. While the written opinions of consultants (Appendix C) vary in their interpretation of different aspects of the EPA data and in their particular responses to the four questions, we would judge that sufficient consensus is present to permit conclusions on the major issues involved. In this context, it is important to stress that

all consultants agree that levels of chemicals detected in storm sewers and in Area 11 (the Canal itself and the first two rings of houses surrounding the Canal) exceed acceptable levels and represent a potential for increased health risk if remedial actions are not pursued and if human access is not controlled. All consultants also agree both regarding the difficulties involved in assessing the large mass of data presented, especially in its current format, and regarding the urgent need for EPA to develop as quickly as possible a concise report of the data, adequate for peer-reviewed scientific publication.

B. Response to Questions

Question 1. Levels of chemicals in the Love Canal declaration area, excluding storm sewers and Area 11, are within the same range of low values (parts per billion) as levels in control areas elsewhere in Niagara Falls. For many chemicals, levels are below detectable limits in both declaration and control areas. Distinctly increased levels are present at the Canal itself and in some homes abutting it as well as in material from storm sewers at many points in the entire area.

Question 2. In general, levels of chemicals in media (air, water, soil) to which people are exposed in the Love Canal declaration area (again, excluding storm sewers and Area 11) are well below established regulatory or advisory exposure limits for those identified chemicals where guidelines exist and, by inference, for closely related compounds. In this context, these levels can be judged not to present risks to human health different from those in the control areas.

This assessment must be interpreted with an important reservation that applies to all such toxicologic judgments. Official safety limits have by no means been established for all possible chemicals, and they are developed for exposure to single chemicals alone, not for combinations. Full data are therefore necessarily lacking on which to base truly complete judgments of chemical toxicity in the Love Canal setting.

Question 3. Although the large number of environmental samples obtained and analyzed by EPA appear to be more than sufficient for numerical comparisons between declaration and control areas, the sampling framework in which specimens were collected is not clear from material presented. To permit a final judgment concerning adequacy of sampling in the Love Canal area, whether for particularly hazardous materials or for chemicals generally, it will be necessary for EPA to provide a full and concise description of the study's sampling plan as well as estimates of statistical power, given the numbers of samples analyzed in declaration and control areas.

Question 4. Any judgment regarding the future habitability of the Love Canal area rests on two important requirements. The first reservation is that appropriate measures must be taken to clean up the obvious contamination of local storm sewers and their drainage tracts. Second, the security of Area 11 must be reevaluated to guarantee permanent containment of chemicals in the dump. To assure habitability into the indefinite future, it is essential that optimal containment methods are installed and maintained and that continuous safeguards are observed to prevent further leakage from the site either through erosion of the clay cover or through its displacement by movement of dump contents. Such safeguards will require 1) surveillance of the site through regular environmental testing of the site drainage system and 2) full maintenance of both the drainage system and of the clay cover. Provided these requirements are fully met, we conclude, based on the analytic measurements of chemicals in the declaration and control areas presented by EPA, that the Love Canal area, outside Area 11, is as habitable as the control areas with which it was compared.

We reach these conclusions concerning the Love Canal area fully recognizing differences of opinion offered by consultants who have assisted in this evaluation. At the same time, we consider it absolutely essential that EPA prepare as soon as possible a full scientific report describing the environmental testing performed at Love Canal. The complexity of the data set and the far-reaching implications which this extensive environmental investigation carries for future approaches in similar toxic waste problems requires prompt and comprehensive communication with the scientific community.

Attachments:
Appendix A, HHS/EPA Agreement
Appendix B, Letter from CDC to Consultants
Appendix C, Reports from Consultants

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta, Georgia 30333

August 6, 1981

Dr. Steven Aust
Department of Biochemistry
Michigan State University
East Lansing, Michigan 48824

Dear Dr. Aust:

In the summer and fall of 1980, the U.S. Environmental Protection Agency (EPA) mounted an extensive environmental chemical testing program around Love Canal in Niagara Falls, New York. This work is now complete, and the EPA has formally requested the U.S. Department of Health and Human Services (HHS) to review the results of their data to determine whether or not they indicate a significant increased threat to human health among residents of the Love Canal area. We ask that you serve as a consultant to consider the EPA data and those of the New York State Department of Health (NYSDH) in this respect. We greatly appreciate your willingness to assist HHS in conducting this review by serving as a consultant to the Centers for Disease Control (CDC). A list of the consultants and government representatives who will participate in the review is enclosed. We will meet on August 13 in Atlanta.

We have enclosed for your review prior to the meeting, a summary report (computer printout) of the EPA testing results, together with maps and a draft narrative report indicating how and where samples were collected. Also included for your consideration are the NYSDH environmental testing results. We ask that you provide us with your written comments on the data either immediately after the August 13 meeting or by mail no later than one week thereafter. Your comments are to be considered confidential until the residents of Love Canal have been informed and the official report is released. The enclosed information is also to be considered confidential, since none of it has been officially released. Because of pending litigation, your comments and the data must not be quoted or shared with others until such time as they are officially released by the government.

We must emphasize that the NYSDH data and the EPA data can only be compared with certain reservations. First, the NYSDH data come from specimens collected prior to or during remedial drainage construction at the Canal, while the EPA data come from specimens collected after construction was [illegible] sample collection methods differed and analyses were not performed in the same laboratories. And third, since the two data sets were not subjected to identical quality control procedures, it is not possible to make precise quantitative comparisons between the two.

We would like you to review the enclosed data with respect to the following questions:

1) Are the concentrations measured significantly different from levels found in other areas of Niagara Falls?

2) Do the levels measured represent concentrations that could cause acute or chronic adverse health effects in people living in the Love Canal area beyond what might be expected under usual residential conditions in the Niagara Falls area?

3) Were sufficient samples taken and analyzed to determine the extent of contamination by particularly hazardous materials and to be able to assess their potential threat to human health?

4) Based on available data, can you conclude that the area is not habitable?

Unfortunately detailed national monitoring data are not available for many of the chemicals measured at Love Canal. We are sending you some information, although it may not be all inclusive.

We will meet on August 13 in Auditorium A at CDC (1600 Clifton Road, N.E., Atlanta, Georgia 30333) to discuss these findings and answer any additional questions that you might have. The meeting will start promptly at 8:30 a.m. An agenda for the meeting is enclosed. At the meeting the complete computer printout of the entire EPA test results will be available with detailed information on quality control.

You will be reimbursed for your expenses and will receive a consultant fee after your written comments have been received at CDC. Although the formal meeting is scheduled only for August 13, it will be possible for you to stay on August 14 to study the complete EPA data set more fully, if you wish.

A hotel room has been reserved for you for the nights of August 12 and 13 (should you wish to continue review of the data on August 14) at the Sheraton Emory Inn, which is located across the street from CDC. Enclosed is information which will provide additional practical information pertaining to the meeting.

Thank you very much for your willingness to serve as a consultant to CDC in this important environmental health matter. We look forward to seeing you in Atlanta on August 13.

Sincerely yours,

Clark W. Heath, Jr., M.D.
Director, Chronic Diseases Division
Center for Environmental Health

Enclosures

HHS CONSULTANTS REVIEWING EPA LOVE CANAL REPORT

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MICHIGAN STATE UNIVERSITY

DEPARTMENT OF BIOCHEMISTRY · BIOCHEMISTRY BUILDING · EAST LANSING · MICHIGAN · 48824

August 19, 1981

Dr. Clark W. Heath, Jr.
Director
Chronic Diseases Division
Center for Environmental Health
Center for Disease Control
Department of Health and Human Services
Atlanta, GA 30333

Dear Dr. Heath:

This letter constitutes my assessment of human health implications of environmental data from the Love Canal area. I would like to present a general assessment of the data and the meeting of August 13 before I address the specific questions in your letter of August 6, 1981.

In general, I believe this study was fairly well conducted and that the results do not convey reasons for alarm. However, I am particularly disturbed by two observations that may, unfortunately, be related. The first involves the non-scientific manner in which the data was presented, and the second concerns the fact that the EPA officials were apparently unconcerned about the first. The callous nature of EPA officials towards the environment they have the obligation to protect is exemplified by their attitude toward those asked to give recommendations to the agency. I can think of no better way to start any EPA activity on a more sure road to its downfall.

First of all there are many examples of very poor science. The PCB data was presented as ppb of a certain Aroclor mixture, which is scientifically unsound. If this was the only feasible method then it should be explained. If peak matching was used to see if the environmental pattern was the same as an Aroclor, what was the confidence level? Is it possible that no PCB would be reported if the GC elution pattern did not fit any of the standard Aroclor GC patterns? This is an example of the lack of adequate explanations also. Tables and graphs should always be able to stand alone such that they can be readily understood by the reader. We never did get an explanation of some tables and maps. I feel very uneasy about drawing any firm conclusions from the data presented or from the discussions held in Atlanta.

Another example of poor science is the lack of sufficient controls and definitions of controls. The lack of sufficient explanations and definitions is apparent throughout the report. The only aspect of the report adequately addressed is the quality assurance. First of all the samples were not described. Secondly, no examples of raw data were provided. Composites were uninterpretable. The maps and tables were not adequately described, difficult to read, and frequently impossible to interpret. Then, at the meeting, we were told to disregard some of the tables, presumably because they were in error. But when asked to explain the error Dr. Deegan could not do so.

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I would have preferred to see examples of raw data, examples of data handling, summary tables, and statistics. The lack of statistics was particularly disturbing. Any statistics should have been accompanied by a rationale for using the particular statistical method. This data is going to come under very close and complete scrutiny. And, various people will be looking for various things. This was pointed out at the meeting by the consultants. Some wanted to see raw data while at the other end of the spectrum some only wanted summary tables. In order to satisfy each and every consultant it is necessary to provide at at least examples of all aspects of the data.

I will now reply specifically to your questions in the letter of August 6.

1. Are the concentrations measured significantly different from levels found in areas of Niagra Falls?

I am assuming that the question refers to areas 1-10 as compared to area 99, and that "significantly different" does not mean statistically significantly different. Certain chemicals certainly appear more frequently in areas 1-10 than they do in area 99. However, the levels of most do not seem to be disturbingly high. It would appear that the migration of chemicals did not occur to a great extent beyond area 11. I would recommend a thorough evaluation of the data and the site such that migration to any area beyond area 11 be identified and that remedial action be taken.

2. Do the levels measured represent concentrations that could cause acute or chronic adverse health effects in people living in the Love Canal area beyond what might be expected under usual residential conditions in the Niagra Falls area?

If the remedial action which has and is being taken is as effective as it appears to be, there would seem to be very little chance for acute or chronic adverse health effects for people living in areas 1 through 10. However, the data should be carefully analyzed and an on-site evaluation made to determine if any migration avenues extended outside of area 11. I make this comment with reference to the identification of obvious migration routes. The sand lenses must be thoroughly investigated to determine their extent.

3. Were sufficient samples taken and analyzed to determine the extent of contamination by particularly hazardous material and to be able to assess their potential threat to human health?

The number of samples taken seems to be sufficient but it may be impossible to guarantee that no small but excessively contaminated "hot spots" don't exist. This statement is made, however, in light of very little explanation of sampling locations. It is my understanding that an attempt was made to sample areas which would be most likely to be contaminated but the fact cannot be guaranteed. Another serious fault with the study is the lack of sufficient control samples. The number of times chemicals were found in control samples is indeed less than the number of finite levels in the declaration area samples but the number of control samples was much less.

The particularly hazardous substance of concern is most probably TCDD and the number of analyses for this compound is limited. However, an area of contamination was found and it must be dealt with. Fortunately, the area is not one normally contacted by people living in the area. I am speaking specifically of the storm sewer system. But its contamination must be noted and corrective action must be taken to prevent indirect exposure to TCDD.

It must be noted that some concern should be expressed considering the number of chemicals in this area. Although the levels do not seem alarmingly high, an inappropriate mixture may exist. With the possible presence of both initiators and promotors the likelihood of carcinogenesis may be increased.

4. Based on available data, can you conclude that the area is not habitable?

I cannot conclude that areas 1 through 10 are not habitable, although I must admit that part of my inability to make this conclusion stems from having very little definitive data or a complete analysis of the data. This hesitancy also stems from a lack of confidence in analyses of environmental samples. It would have been desirable to be able to assess the ability to duplicate data in all samples. This would be particularly important for soil samples where recovery may be variably affected by binding of the chemicals to the soil. However, my confidence in this conclusion is strengthened by the absence of any highly contaminated samples. Also, the biota did not reveal the presence of any bioaccumulated substances.

Finally, there were some very positive results of the study. The best example of this is the fact that the theory that chemicals may have readily moved via the old swails seems unproven. Also, there does not seem to be evidence for at least major migrations by dump trucks. No excessively contaminated "hot spots" were found. Finally, the "natural" barriers to migration seemed quite effective. I am speaking primarily of the barriers provided by streets and the installation of sewers. It also seems apparent that the leachate system that was installed is in fact effective.

Sincerely,

D. Aust

Steven D. Aust
Professor of Biochemistry

SDA/cmc

GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA 30332

CHEMISTRY

August 19, 1981

Dr. Clark W. Heath, Jr., M.D.
Director, Chronic Diseases Division
Center for Disease Control
Atlanta, GA 30333

Dear Dr. Heath:

Following the meeting held at CDC on August 13, to review health hazard data on the Love Canal, I am enclosing my comments and recommendations on the material considered.

General:

The format of the analytical data presentation made effective comparison between the various Tables difficult. Consequently, it was not really possible prior to the meeting to give a rigorous treatment to the data and arrive at any firm conclusions. In addition, the lack of appropriate units to the primary computer print-out of data made evaluation of these dimensionless numbers impossible.

During the course of the meeting, and also subsequent to the meeting, the meaning and implications of the results contained in the reports have become clearer, as a result of questions and discussions raised at the time. Nevertheless, there remains a lingering concern that much of the information contained in the reports is not fully clarified at this time.

While the position of EPA towards the data, namely a desire to present raw values, with minimum interpretation by them is understandable, it is probably not a helpful position for arriving at an informed opinion. Consequently it is recommended that EPA provide a report based on the available material, but more in the form of a scientific paper. This could concentrate on a Results and Discussion Section which would explain the data contained in the Tables, provide statistical treatment where appropriate and discuss the implications of the data in the light of the statistical treatment. As with my scientific paper, the discussion of the data would be open to question and clarification by the review group. It is felt that in the absence of such a report the magnitude of the task facing the consultant group in reviewing this material will result in unclear recommendations to HHS.

A meeting to review the total data, with as long a lead time as possible, would be most helpful.

In the light of the foregoing reservations regarding comprehension of the data, the following comments should only be considered as tentative and subject to review.

1. Quality of Analytical Data.

The procedures used for sampling and chemical analysis, including QA and QC testing appear to be of the highest quality. While certain discrepancies certainly exist between various laboratories, these are typical for trace organic analysis at these low levels. With the proviso that the EPA procedures of running duplicates for only 10% of samples is unacceptable to many analytical chemists, the overall quality of the data can reasonably be considered to be excellent.

2. Comparison of Concentrations of Various Chemicals with Niagara Falls Area 99.

In general, the data appear to indicate no significant pattern of contamination for the toxic species examined in the Love Canal area compared to the surrounding district, with the exception of the immediate vicinity of the Canal (Area 11). Area 11 appears to show significant soil contamination compared to Area 99. Many of the chemicals found at significant levels in air samples (e.g. benzene) probably cannot be attributed to migration from the canal site, as there is no evidence of dumping these chemicals there.

3. Toxic Hazards of Pollutants to Area Residents.

At the present time, with the remedial action that has been taken, there appears to be little hazard to homes outside Area 11. Such conclusions, however, could be vitiated by any reduction in the quality of the pollution containment and monitoring procedures that are currently in effect. In particular, the clay cap over the site will need constant attention and maintenance to ensure that no adverse leakage takes place, if settling occurs as water is drawn from the treatment plant.

4. Habitability of Love Canal Area.

Area 11 should probably be considered permanently closed to human habitation or general ingress, and the present houses removed. The potential for future exposure to toxic materials seems to involve too high a risk to be justifiable.

Surrounding portions of the study area (Areas 1-10) appear to offer no greater health risk than that experienced by the general population of Niagara Falls, due to prevailing air pollution levels.

I hope that these comments are of some value to you in considering the response of HHS to the EPA study.

Yours sincerely,

Richard F. Browner

Richard F. Browner
Associate Professor
of Chemistry

RFB/jap

"This report represents the opinion of the author. It carries no official endorsement by the Georgia Institute of Technology".

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August 21, 1981

Clark W. Heath, Jr., M.D.
Director, Chronic Diseases
Division, CEH
CDC, PHS, HHS
Atlanta, Georgia 30333

Dear Dr. Heath:

In response to your request, I have reviewed the EPA analytical and testing results, the NYSDH environmental testing data, and the other materials provided in preparation for our meeting on August 13, 1981, in Atlanta. In responding to the four questions posed in your letter of August 6, I have focused primarily on the EPA data, although there is consistency in many aspects of the NYSDH and EPA data despite the differences in collection period (prior to versus post-remedial measures) and sampling (air sampling versus multi-media sampling).

The first question is perhaps the most difficult to respond to since it appears from the EPA data and the summary tabulations of the data (pg. 41, 51, 54, 55, 57, 60, 61, 72, 100, 109) that for most of the chemicals analyzed the levels in the declaration area exceed the levels in the control area or in study area 97. The key question here is whether the concentrations measured in the declaration area are significantly different from levels found in other areas. Although I have carried out some calculations using the individual EPA data (2nd book) to attempt to validate and understand the data presented in the summary tables, I do not feel comfortable with this process. During the meeting on August 13, it was suggested that the data in the tables should be presented in a form that would permit the casual reader to more fully understand and evaluate the data. I would agree with this suggestion on the basis that the data as presented appears to be somewhat misleading. Perhaps Dr. Deegan could work with CDC analysts to accomplish this.

The second question asks whether the reported levels are likely to cause adverse health effects. I have focused here primarily on the organics, since the inorganics are highly variable and are probably more closely related to geologic criteria than to material deposited in the canal. Both the EPA data and the NYSDH data indicate that the levels of the organics are low in comparison with TLV values or other criteria used for evaluating risk, and my response to this question is that such cause and effect relationships are unlikely.

The third question asks whether the sampling procedures were adequate. My impression of the EPA data is that the number of control samples is rather small, but since there is rather good consistency in the data from the various media sources, I would conclude that the sampling was adequate, at least in the area of interest (the declaration area). Some concern was expressed at the Atlanta meeting concerning the integrity of the samples during storage prior to analysis (leakage through septems, etc.), and this is certainly a potential problem if it did occur. However, again on the basis of sample consistency, it would appear to me that this does not appear to have been a problem in the EPA data.

The final question asks about the safety of the area for habitation. Since the canal area is obviously heavily contaminated and will remain so for years, the use of this land in such a way as to prevent migration of the buried agents or exposure of populations will present very long-term planning difficulties. On the other hand, the declaration area does not appear to present any clear and evident hazard to residents as long as the contamination of the canal area can be controlled. My concern with making recommendations regarding the habitation of the declaration area derives primarily from a concern about the ability of any legislative or regulatory group to maintain proper control and surveillance of any residential area over extremely long periods of time. Thus, I would not advise residents of this area to move out of the area, but neither would I encourage new residents to move into this or any area with the potential problems that could arise as a consequence of living next to a land-fill containing large amounts of hazardous materials.

The problems of Love Canal are not unique to Niagara Falls, and they involve much more than the toxicologic or adverse health effects evaluations. The benefits side of the risk-benefit equation is even more complex than the risk side of the equation, but it cannot be ignored. In answering questions such as those above, scientists and particularly toxicologists need to distinguish between predictions or conclusions which are based on an evaluation of the toxicity data base for an agent as opposed to opinions or conclusions which are not based on any special expertise. My answer to the last question probably falls in the latter category.

Sincerely yours,

John Doull, M.D., Ph.D.
Professor of Toxicology

JD/mkh

ENVIRONMENTAL DEFENSE FUND

August 21, 1981

Dr. Clark W. Heath
Director
Chronic Diseases Division
Center for Environmental Health
Centers for Disease Control
Atlanta, Georgia 30333

Dear Dr. Heath:

Let me begin by again thanking you for the opportunity to participate in the recent workshop held at CDC on August 13, 1981 to assess the human health implications of environmental data from the Love Canal area. The rest of this letter will serve as my report on that meeting.

Before discussing in detail the conclusions I reached, I think it is necessary to briefly describe my feelings as I approached the evaluation of the data presented to me. The Love Canal problem has received enormous notoriety and if one word could generally characterize both the scientific studies performed and the review of these studies, that word would have to be "inadequate." While health and environmental assessments at Love Canal have been numerous, many questions remain about the adequacy of the scientific methods used and the quality of the data generated. Likewise, the review of data, such as presented in the Lewis Thomas Report, can be heavily criticized as cursory in nature and inadequate in scope. Therefore, I approached the review of the data presented to me with the belief that the efforts we were undertaking had to provide a scientifically critical review of the data collection methodology, the data analysis techniques and the conclusions reached.

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It was clear from the outset of Dr. John Deegan, Jr.'s presentation that he did not expect us to carefully review the data but rather to rely heavily on his personal conclusions in order to establish our conclusion as a panel. In fact, one of Dr. Deegan's assistants, when speaking to me, stated that it was EPA's belief that we would "trust" what they said and answer the four questions posed based on EPS's data review. Since I do not believe it is our role as scientists to merely accept what we are told, I approached the assignment given us by asking three basic questions. These questions were:

1) Are the data and analysis presented clear, accurate and if so, what do they show?

2) How accurately does the picture created by the data reflect the current situation at Love Canal and how likely is that picture to remain constant in the future?

3) Can the four questions posed be answered based on the data presented and if so, how would I answer them?

My comments are presented below in answer to these three questions.

To begin to answer the first question, are the data clearly and accurately presented, one need go no further than the printed material we received. As Dr. Whittenberger noted early in our discussion, the data were often in an unreadable and unintelligible form and certainly not in standard, proper scientific format. Moreover, once the material was deciphered, it was evident that we had been presented selected segments of the raw data base, rather than a compilation or summary of all the data that had been gathered. The rationale offered for this presentation by Dr. Deegan was that EPA hoped to avoid biasing the conclusions of the reviewers. While I appreciate his concern, the material presented was clearly inadequate to conduct a proper scientific analysis.

In response to criticisms of the format, Dr. Deegan suggested that any reviewer who wished could refer to the entire raw data base in order to conduct his or her own analysis. Such a suggestion could not be taken seriously, given the amount of time it would have taken for any individual to have made sense out of the vast amounts of raw data that had been collected. If any further analysis of these data is deemed necessary, I would suggest that the data be provided to us in a completely revised format, a format similar to that used in the publication of a peer reviewed article. To avoid biasing the conclusions of the reviewers, the data could be presented clearly and accurately, statistical analyses could be provided and the reviewers left to draw their own conclusions.

The problems that arise in analyzing segments of raw data often presented in an illegible manner are demonstrated by the following two examples. Dr. Deegan, in making his presentation, provided the review panel with his personal view of the meaning of the data. One conclusion that Dr. Deegan drew was that the extent and level of chemical contamination in the declaration area was no higher than in the control area. Referring to page 41 of the document entitled "Environmental Monitoring at Love Canal, 1980" which had been distributed to us, I question the veracity of that conclusion. Reviewing the data, I found that the presence of organic chemicals in the declaration area far exceeded their presence in the control area. In all cases, the levels of chemical contamination in the declaration area exceeded those in the control area and thus I found it difficult to reconcile the data with Dr. Deegan's conclusion.

Upon questioning, Dr. Deegan indicated that the table presented on page 41 was inoperative and really should not be referred to for data analysis. Rather, he suggested that the large compendium of data by areas within the declaration area and for the control area be referred to instead. In a few minutes, during the lunch hour, I reviewed the data in these tables. For each area I counted the number of organic chemicals found in soil samples and compared these findings to the control area. The results are presented below.

Area	Number of Organic Contaminants Found in Soil
Control	2
Area 1	11
Area 2	16
Area 3	14
Area 4	20
Area 5	6
Area 6	3
Area 7	16
Area 8	2
Area 9	34
Area 10	10
Area 11	30

In all cases, it is clear that the number of organic chemical contaminants found in soil in each area of the declaration area exceeds the number of such chemicals found in the control area. When presented with this conclusion, Dr. Deegan suggested that a statistical analysis of this data showed the apparent differences to be insignificant. Unfortunately, neither this statistical analysis nor any other analysis were provided in the materials we received. Consequently, it is impossible to judge whether the differences are insignificant or in fact indicate a significant contamination of the declaration area compared to the control area.

In further discussion of this issue, Dr. Deegan indicated that the statistical analysis that had been performed evaluated each chemical individually for its presence in the declaration area and the control area. It is my scientific judgment that a number of these chemicals should have been considered together because they are likely to have emanated from a single source. For example, alpha, beta and gamma BHC and lindane, if found, should all have been considered together. The failure to find all four in one soil sample is easily explained by the fact that these chemicals may have diffused widely from the point source from which they emanated and the soil sample taken was extremely limited and likely therefore to have missed a number of chemical constituents. If a further review of this data is to take place, I would suggest that proper data analysis be presented so that the reviewers can evaluate the method of data analysis and the conclusions reached.

A similar confusion arises in an evalution of the data on organic air pollutants found in the control area and in the declaration area. Again, after Dr. deegan presented his conclusion that the extent and level of chemical contamination found in the declaration area and control area were no different, I quickly compared the levels of o-dichlorobenzene measured in living areas in both the control area and the declaration area. The results of that comparison are presented below.

Area	Mean Level Found (ug/m3)
Control	none reported
Area 1	28.4
Area 2	9.3
Area 3	13.1
Area 4	4.9
Area 5	4.6
Area 6	6.5

Area 7	6.4
Area 8	29.4
Area 9	6.5
Area 10	4.1
Area 11	5.1

As in the case of the soil analysis previously presented, it is clear that in every area of the declaration area, living area air was more highly contaminated with o-dichlorobenzene than in the control area. In fact, by referring to the large compendium of data provided to us, one would conclude that o-dichlorobenzene was not found at all in the control area.

Dr. Deegan quickly corrected this misunderstanding by referring to page 74 of the document entitled "Environmental Monitoring at Love Canal, 1980." He noted that in sampling for o-dichlorobenzene this chemical had been detected at the detection limit in 10% of the cases, as compared with 43.4% of the cases in the declaration area. I failed to make this comparison, largely because the table provided is illegible. When questioned whether the incidence of o-dichlorobenzene contamination in the declaration area was statistically significant compared to the control area, Dr. Deegan reported it was. Consequently, it was hard to understand how he reached a conclusion that the control area and the declaration area were equally contaminated. Dr. Deegan quickly pointed out that for p-dichlorobenzene the reverse pattern of contamination was observed. He suggested that it therefore might be appropriate to consider evacuating the control area. Such sarcastic statements have no place in a proper scientific disucssion.

I am left with the conclusion that there is a great deal of ambiguity about the meaning of the data collected by EPA. The data analysis referred to above certainly suggests that chemical contamination of the declaration area exceeds contamination in the control area. While this was not Dr. Deegan's conclusion, it will remain mine until I can be shown that these and similar analyses are in some way inappropriate or incorrect.

An additional point to consider is the quality of data presented to us and the conclusions that can be drawn from it. I remain quite concerned that the quality control experienced in these studies is less than adequate. This is not to suggest that the methodologies chosen by EPA are less than state-of-the-art. At this point in time I have not personally reviewed the appropriateness of each test methodology employed by EPA, and must rely upon conclusions of experts like Dr. Browner that, in terms of analytical techniques, the methods selected by EPA are appropriate. However, Dr. Browner in his discussion of this issue alluded to the fact that he could make no judgment about the sampling procedures used by EPA nor the adequacy of the treatment of the samples prior to analysis. The materials presented to us clearly indicate that there was a significant variability in the analytic capabilities of the laboratories employed to conduct the environmental analysis at Love Canal. Moreover, several significant questions still remain regarding the effect of unusually long storage periods prior to sample analysis. For example, on page 142 of the document entitled "Environmental Monitoring at Love Canal, 1980" there is a discussion of the effect of holding times on the analysis for volatile organic chemicals. The report states that "only minimal loss of purgeable organics" occurred when the holding time for analysis was 18 weeks after collection rather than 4 to 5 weeks. It is unclear what the term "minimal loss" really means, and I would wish to see data regarding the number of chemicals analyzed and what percentage of loss that actually occurred. Furthermore, and perhaps more important, is the conclusion stated in the report that "losses, if any, in the first few weeks are indeterminable at this time." Therefore, the magnitude of loss of volatile organic chemicals that occurred during the first 4 to 5 weeks of storage is unknown and it is highly likely that under certain holding conditions a significant portion of volatile organics would have been lost.

One final point needs to be made in discussing the analysis of the data presented to us and that concerns the number and identity of the control areas chosen. In presenting his review of the data, Dr. Deegan indicated that different numbers of samples were taken for analysis from different environmental media. For example, if my notes are correct, of 19 sites selected for surface water sampling, 14 samples were taken from within the declaration area and 5 from the control area. Similarly, of 79 different sites sampled for groundwater analysis, 68 were from within the declaration area and 11 were from the control area. The ratio of samples obtained from the test area (areas 1 through 11) to the control area (number 99) suggests that the sampling pattern heavily favored the collection of samples from within the Love Canal area. While I am not a statistician, I believe that a skewing of sample selection so heavily toward the experimental neighborhood may make the study relatively insensitive compared to a study where a better balance between samples collected from the experimental area and the control area is achieved. In further discussions of this data I would like an analysis by a statistician as to the significance of the effect of the sampling pattern on the sensitivity of the study.

In addition, I believe we need a much better explanation of how the control areas were selected, for what criteria they were matched compared to the Love Canal declaration area, and whether in fact any of these sites themselves were contaminated. Dr. Paigen raised the point that one of the sites, namely Control Site C (see page 4 of the document "Environmental Monitoring at Love Canal, 1980"), the site in the vicinity of 7320 Packard Avenue is in close proximity to, or actually overlaps, a known hazardous waste dumpsite. If this is true, then a thorough analysis needs to be provided to assure us that the control site is clearly distinct from the area known to be a chemical dumpsite and that no contamination from that site would be detected in sampling at the control area. Moreover, nowhere in the materials presented are we informed as to which values for control readings come from which of the control sites. I would find it very helpful to know where the control data comes from, especially after learning more about the nature of each of these control sites and their appropriateness to serve as controls for the Love Canal declaration area.

Whether one concurs with the conclusions reached by Dr. Deegan or finds that the data suggest something entirely different, the question of rehabitation necessitates a judgment on how predictive the current picture is for the future. This issue was addressed by several of the participants in the working group, including Dr. Doull, Dr. Kim, Dr. Pellizzari and myself. Dr. Pellizzari commented that we are only looking at a "microcosm of the total reality." Dr. Kim cautioned that it might be advisable to continue monitoring for some time into the future, before making a judgment on the habitability of the site. He questioned the advisability of predicting future conditions based on our current knowledge.

I strongly concur with the sentiments of those participants noted above because I too have great reservations about the applicability of the current data to predicting the future situaton at Love Canal. As one example of the possible changing nature of the conditions at the Canal, I offer the observation I have made on visits to several other dumpsites where clay caps have been used as part of the remedial cleanup plan.

At the Kin Buc dump in New Jersey and Gratiot landfill in Gratiot County, Michigan, clay caps were put in place, topsoil applied, and the area seeded. Within 12 to 18 months, both caps showed significant deterioration resulting from subsidance and erosion. There is no guarantee even in the short term, no less in perpetuity, that the cap at Love Canal will be properly maintained. There are no funds designated for long term maintenance. Consequently, the cap at Love Canal may deteriorate with time. Dr. Kim has already reported that when cracks developed in the current cap prior to sodding, one could detect the escape of volatile organic chemicals. I believe, therefore, that any discussion of the possible future uses of the Love Canal area must address concerns such as the maintenance of the cap and explore the likelihood for changes in the nature of the conditions that exist today.

Finally, we must ask whether the four questions we addressed can be answered based on the available data, and if so, how we would answer them. The first question asks "Are the concentrations measured significantly different from levels found in other areas of Niagara Falls?" This question is difficult to answer, based on the available data. The analysis presented above suggests that the number of chemical contaminants and, in many cases, the level of contamination in the Love Canal declaration area exceed those in the control area. However, since we were not provided with adequate descriptive information about the control areas, it is impossible to conclude whether they are representative of the Niagara Falls area in general. In order to properly answer this question one would have to have a more complete analysis of the data collected and would need more extensive information on the control areas and their relationship to other areas in the Niagara Falls vicinity.

Question #2 asks "Do the levels measured represent concentrations that would cause acute or chronic adverse health effects in people living in the Love Canal area above what might be expected under usual residential conditions in the Niagara Falls area?" I suggest that this is an impossible question for anyone to answer because of our very limited knowledge of the toxicological effects of lifetime low level exposures to a wide variety of chemical toxins. Moreover, in many cases, the toxicological risk posed by exposure to many of the chemicals reportedly disposed of in Love Canal is unknown. Therefore, it is impossible to make an accurate judgment about the likelihood of health impairment if exposure to these chemicals occurs. In addition, in order to answer this question one would have to assume that the data generated in the control areas are representative of the conditions in the general Niagara Falls area. At this point we certainly don't know that to be a fact.

As discussed at the workshop meeting, there is an another element of information that needs to be considered in attempting to judge the toxicological risk of habitation of the

Love Canal area. That element is the data generated on the adverse health effects that have already resulted from living at Love Canal. It is the conclusion of both the State of New York and Dr. Beverly Paigen that an increased incidence of adverse birth outcomes resulted from residing in the Love Canal community. In addition, Dr. Paigen's work also suggests that other forms of health impairment (i.e., the incidence of asthma) were elevated in the Love Canal community. The available health effects data has been criticized for various scientific inadequacies. The environmental data we have been asked to review is, in my judgment, flawed in a variety of respects as well. Consequently, the best judgment that can be made about the risk to human health from residing in Love Canal would be a judgment based on both the evidence we have from environmental monitoring and from health effects testing.

Even if we were able to accurately predict the adverse health consequence of exposure to all the chemicals in the various environmental media, we would be hard pressed to determine whether the reported level of chemical contamination is accurate or is predictive of future conditions. With regard to the current situation, it is unclear from the data presentation what margin of error exists for the reported levels of chemical contamination . Further analyses would have to be provided in order for anyone to feel confident in judging the true magnitude of current contamination reported within the declaration area.

Concerning future patterns of contamination, it is my belief that, based on the data before us, we are unable to predict with any accuracy what the future will be. Disruption of the clay cap as noted above might lead to far greater contamination of the declaration area. Suggestions voiced at the workshop that the area designated by EPA as Area 11 might become a park or a public playground indicate that the integrity of the clay cap in that area might be at far greater risk than merely from erosion, subsidance and lack of maintenance. Any activity that would have people using the canal site as a playground or park would most surely jeopardize the integrity of the clay cap.

Moreover, even Dr. Deegan noted that for certain environmental media, contamination within the declaration area far exceeded that in the control area. Most notably Dr. Deegan spoke about the contamination of sewer lines and sediments. While Dr. Deegan alluded to the fact that EPA had just announced plans for the cleanup of the sewer lines and sediments, it should be remembered that this announcement of cleanup is not new. Under the pevious Administration, the Regional Administrator for Region II announced a program that was also going to clean up the sewer lines. However, that program was not undertaken. Consequently, one should not assume that the promise of cleanup programs means that cleanup will occur. Finally, on this same point it should be noted that while Dr. Deegan stated that the barrier drain system was operating as designed and "the material was moving back faster than it had ever moved out," there is no documentation for such a statement in the materials presented to us. This is a significant point because previous reports about the functioning of the barrier drain system were less optimistic about its working success.

The third question posed was "Were sufficient samples taken and analyzed to determine the extent of contamination by particularly hazardous materials and to be able to assess the potential threat to human health?" At the workshop, you attempted to have the consultants answer this question with respect to dioxin contamination. In my judgment, insufficient discussion took place about this question . Differences of opinion were voiced as to the potential threat posed by dioxin exposure, but the direct intent of the question (i.e., the sampling or review of the sampling regime) was not discussed.

I agree with those who expressed concern over the high levels of dioxin in soil samples taken in the Love Canal declaration area. As one participant noted, it certainly is difficult to explain to the public that parts per billion levels in soil are an insignificant risk when the Commissioner of Health of the State of New York has warned people against eating fish contaminated with parts per trillion of the same chemical. Obviously, the exposure that may result from eating fish contaminated with dioxin as opposed to living in an area with dioxin-contaminated soil is not the same. However, it should be remembered that young children, for example, often play in soil and very young children may in fact ingest soil.

The last question posed to the consultants was "Based on available data, can you conclude that the area is not habitable?" This question might as well have been asked in the following way: "Based on available data, can you conclude that the area is habitable?" Had the latter question been posed, I think the answer clearly would have been "No." The environmental monitoring data presented to us is, in my judgment, an insufficient data base on which to conclude that the Love Canal declaration area is habitable and that individuals should be encouraged to move back in. Because the question is worded as it is, any belief that the data base we have to rely on is inadequate would force one to answer the question in the negative. The conclusion that most likely would be drawn from that response is that the respondant believes that the declaration area should be rehabitated. I certainly do not believe that the evidence we were asked to consider allows one to conclude that the Love Canal declaration area is a safe place to live. I strongly believe that CDC and the Department of Health and Human Services would be making a grave error if they concluded from a review of this data that the Love Canal declaration area was safe to live in, and that individuals should be encouraged to relocate there. At best, our judgment must be that the data base presented to us, taken alone, is insufficient to reach a conclusion on habitability that would be scientifically supportable. If forced to offer a more definitive opinion, then one would have to say that no one should be encouraged to relocate in the Love Canal area based on what we know today.

I recognize that a number of families in the declaration area have chosen to stay rather than to move out. That is clearly their choice to make. I believe we have a responsibility as scientists to -- as best as we can -- explain the significance of the data that have been gathered, and to be honest and straightforward about the numerous uncertainties that exist. If these individuals continue to choose to stay, that is their right. Providing such advice is clearly different from actively supporting a conclusion that the declaration area should be reinhabited.

I hope these comments will be useful to CDC in making a recommendation to EPA regarding the meaning of the environmental assessment data. At the workshop you stated that the final report that will be prepared by the Department of Health and Human Services for EPA will have our letters to you attached as appendicies. I believe it is essential that our comments be included because I want to be sure that the views of all consultants are clearly and accurately presented.

As I indicated at the meeting, I would be happy to participate in another meeting if that would be useful to CDC. I would, however, request that if such a meeting is to take place, we be provided with more time to review any data we will be expected to discuss. Again, thank you for the opportunity to participate in the workshop and to serve as an expert consultant to CDC on this matter.

Sincerely,

Joseph Highland /ec

Joseph Highland, Ph.D.
Chairman
Toxic Chemicals Program

JH:ec

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Aug. 23, 1981

Clark W. Heath, jr., M.D.
Director, Chronic Diseases Division
Center for Diseases Control
Atlanta GA, 30333

Dear Dr. Heath:

Enclosed please find my report "Threat to Human Health Among Residents of Love Canal Area, Niagara Falls, New York". This is the report requested from my service as a consultant to Center for Diseases Control following the meeting on the above subject held in Atlanta, Georgia on August 13.

I hope that the submission of this report satisfactorily completes my consultant assignment.

Sincerely,

Robert L. Metcalf

Robert L. Metcalf
Professor Biology, Entomology,
Environmental Studies

REPORT TO
CENTER FOR DISEASE CONTROL
ON
THREAT TO HUMAN HEALTH AMONG
RESIDENTS OF LOVE CANAL AREA
NIAGARA FALLS, NEW YORK

Robert L. Metcalf
Institute for Environmental Studies
University of Illinois, Urbana, Illinois

INTRODUCTION

Analyses of the problems in environmental toxicology around Love Canal in Niagara Falls, New York are complicated by the vast amount of analytical data made available from various aspects of environmental monitoring. Many of the pollutants monitored including heavy metals, polynuclear aromatics, halogenated aliphatics, acrolein, acrylonitrile, benzene, toluene. xylenes, and polychlorinated biphenyls; represent the broad range of chemical pollutants typically found in the urban industrial environment. The amounts detected in Niagara Falls, are more or less typical of urban industrial environments in New Jersey, Louisiana, Texas, Arkansas, and West Virginia (List of Compounds found in Ambient Air, CDC). Without in any way minimizing the undesirability of their presence in the air and water consumed by humans, it is concluded that these "typical" pollutants are not adequate indicators of the possible hazards of Love Canal dumping on the habitability of adjacent residential areas.

Therefore, to properly analyze the environmental toxicology in the residential areas in the vicinity of the Love Canal chemical waste dump, I have concentrated on data indicating the presence of organic chemicals representing typical and persistent toxic waste products from Hooker Chemical Company operations during the years 1942 to 1953. According to data furnished by the company to the New York State Health Department, at least 21,700 tons of such wastes were dumped into Love Canal during this period. Hooker Chemical Company pioneered during and immediately after World War II in the production of a large variety of chlorinated aromatic compounds including 2,4,5-trichlorophenol and chlorobenzenes; benzotrichloride and other chlorinated toluenes; photo-chlorination of benzene to produce lindane and other isomers of hexachlorocyclohexane; and the highly reactive hexachlorocyclopentadiene for Diels-Alder diene syntheses of the insecticides aldrin, chlordane, heptachlor, endosulfan, and mirex.

The toxic chemicals selected as suitable indicators for this evaluation are shown in Table 1 together with available data on TLV values for human industrial exposures to contaminated air and ADI values for contaminated drinking water. In the subsequent Tables 2-7, the available analyses for the maximum detected concentrations of these indicator chemical pollutantsin various environmental situations, i.e., human living areas, drinking water, shallow wells, soils, sanitary sewers and sumps are tabulated for the Love Canal dump site (11), for the residential areas immediately adjacent in the West (2, 3), North (4), and East (6, 8), and the miscellaneous control area (99).

Soil: The data in Table 2 for pollution of storm sewer sediments clearly indicate the very extensive pollution of Love Canal (Area 11) with a wide variety of toxic chemicals. These have been transported by leaching in large amounts through the storm sewer system with the worst pollution being found in Area 4 to the North. However, the large ppm quantities of the several pollutants found throughout the adjacent areas suggests a rather massive movement of the sub-surface soils throughout the entire storm sewer system. The serious nature of the contamination of the adjacent aras from this source is clearly shown by the tetrachlorodibenzo-p-dioxin concentration of 672 ppb recorded in Area 4 together with 20,000 ppb of γ-hexachlorocyclohexane (lindane insecticide). We understand that EPA will undertake to clean up the storm sewer contamination and that capping of the Love Canal area and the provision of a leachate treatment facility should substantially decrease the movement of the toxic pollutants through the storm sewer system.

The data for soil contamination (Table 3) shows evidence of migration of dichlorobenzene to Area 2. Further analytical data for other hazardous pollutants in the "declaration zone" would appear desirable.

Water: The sump water (Table 4) and shallow well data (Table 5) if representative and reliable appear to indicate substantial ground water pollution only in the Love Canal (Area 11). This is essentially what would be expected because of the relatively deep burial (ca 30 feet) of the 21,700 tons of pollutants. The deep well data is essentially negative for the key chemical pollutants in all sites. The water sampling data for storm and sanitary sewers (Table 6) is, however, indicative of movement of toxic chemicals in water from the Love Canal burial site to the adjacent declaration areas. The presence of the highly toxic tetrachlorodibenzo-p-dioxin in Area 2 and hexachlorocyclopentadiene in Area 8 is particularly disturbing. Rather large amounts of dichloro-and trichlorobenzenes and γ-hexachlorocyclohexane in storm sewer water of Area 2 and lesser amounts in Areas 4 and 8 also demonstrate the spread of the pollutants from Love Canal into the "declaration area" through water. Thus additional and regular monitoring of storm and sanitary sewer water for the presence of the key pollutants is highly desirable.

Air: The air sampling data from Living Areas (Table 7) is difficult to interpret because of the small number of key pollutants monitored. The data are almost entirely restricted to dichlorobenzenes and chlorotoluenes that are among the most volatile of the key pollutants. The presence of these in Living Areas, however, is greater (at maximum values) in the "declaration areas" 2, 3, 4, 6, 8; than recorded in Area 99. These maximum values especially for dichlorobenzenes are 4.4X greater in Area 6, 6.5X greater in Area 4, 11.5X greater in Area 2, 12.5X greter in Area 3, and 26X greater in Area 8. These substantially increased values must be significant and air monitoring in Living Areas for other volatile key pollutants especially hexachlorocyclopentadiene and hexachlorobutadiene should be made to confirm air movement.

ANSWERS TO QUESTIONS POSED:

Q-1 - Are the concentrations measured in the declaration area significantly different from levels found in other areas of Niagara Falls?

A-1 - As shown in Tables 2-7, concentrations of the specific pollutants associated with the Love Canal waste disposal are relatively very high in the Love Canal Area (11) in storm sewer sediments (Table 2), soil (Table 3), water-sump (Table 4), and water-shallow well (Table 5).

The evidence for leaching and migration away from the Love Canal dump area is strongest with storm sewer sediments where relatively large amounts of important pollutants such as γ-hexachlorocyclohexane, hexachlorobenzene, tetrachlorobenzene, dichlorobenzenes, and trichlorobenzenes were found in Areas 3, 4, and 8 and to a lesser extent in Area 2. Particularly ominous, of course, is the very high level of the extremely toxic tetrachlorodibenzo-*p*-dioxin (TCDD) found in Area 4. Migration of these substances will undoubtedly be decreased by the remedial construction undertaken but cannot be discounted as a long term source of contamination of the "declaration area" by highly toxic and relatively non-volatile pollutants. *Thus, there is reliable evidence of concentrations of key pollutants in areas adjacent to Love Canal significantly higher than in the other areas of Niagara Falls.*

Q-2 Do the levels measured represent concentrations that could cause acute or chronic adverse health effects in people living in the Love Canal beyond what might be expected under usual residential conditions in the Niagara Falls area?

A-2 It is impossible to answer this question in the negative. The presence of at least 21,700 tons of hazardous pollutants in the Love Canal and the evidence summarized in A-1 that detectable amounts of these are to be found in the adjacent Areas 2, 3, 4, 6, 8 suggests that people living in these areas will be exposed to trace chemical insults from a variety of highly toxic chemical pollutants for generations. Several of the key chemical pollutants including tetrachlorodibenzo-*p*-dioxin, hexachlorocyclopentadiene, and hexachlorocyclobutadiene are extraordinarily toxic. Others such as γ-hexachlorocyclohexane (lindane) and hexachlorobenzene have been strictly regulated or proposed for regulation by the World Health Organization, EPA, OSHA, etc. All of these chemicals are suspect carcinogens. The epidemiological studies of birth defects, abortions, and chromosomal aberrations made in the Love Canal and adjacent areas, while subject to disputations, are significantly disturbing to demand a strongly conservative attitude about promoting the exposure of thousands of persons, especially young children to these trace chemical pollutants over a lifetime.

Comparisons of environmental health standards for air quality i.e. 8-hour TLV-TWA values, and drinking water i.e. ADI values; with maximum air pollution levels and water contaminations recorded for the Love Canal area, are somewhat reassuring. The maximum detected levels for most of the key pollutants for which the data are available are very substantially less than accepted standards. However, tetrachlorodibenzo-*p*-dioxin, the most toxic of all the pollutants is a notable exception and analytical data are so sketchy for the highly toxic hexachlorocyclopentadiene and hexachlorocyclobutadiene that together with inadequate study and standards for these pollutants the results are virtually meaningless. The use of 8-hour TLV's for air pollutants for evaluation of the 24-hour lifetime exposures that are found in the declaration areas is also very misleading. For lifetime exposures the spectrum of sensitivity of the exposed population including the very young and the aged is much wider than that of an occupationally exposed population. The threat of mutagenic, carcinogenic, and teratogenic chemicals is very much greater. All of these conditions suggest the need for a safety factor of at least 1000 for the very hazardous chemicals concerned, that should be superimposed upon any considerations of TLV values.

The answer to question 2 is that the concentrations of key pollutants detected in the Love Canal area could cause adverse health effects beyond those in usual residential conditions in the Niagara Falls area.

Q-3 Were sufficient samples taken and analyzed to determine the extent of contamination by particularly hazardous material as to be able to assess their potential threat to human health?

A-3 Although a large number of samples were taken and analyzed and the values obtained seem to be reliable within the present state of the art, sampling and analysis were not rigorous enough to describe adequately the human health threat from the highly toxic key pollutants of Love Canal. The largest gaps in the sampling scheme are for the highly toxic hexachlorocyclopentadiene and hexachlorobutadiene, and tetrachlorodibenzo-*p*-dioxin. More effort should be expended on routine and regular sampling for the other key pollutants such as lindane, hexachlorobenzene, pentachlorophenol, pentachloronitrobenzene and the more volatile di-,tri-,tetra-chlorobenzenes and phenols, and chlorinated toluenes.

Q-4 Based on available data, can you conclude that the area is not habitable?

A-4 In the writer's opinion the immediate Love Canal (Area 11) should be completely barred to human access. Suggestions that it become a "park area" are irresponsible. It is much more difficult to assess the habitability of the "declaration areas" especially Areas 2, 3, 4, 6, 8 adjacent to Love Canal. Concerns aroused by the pollutant monitoring and epidemiological studies cannot be erased by the data presently available. Additional monitoring data is important to determine the effects of the remedial capping and barrier construction instituted in the Love Canal and to fill the voids in the analysis of key pollutants as indicated above. The writer does not believe that it would be responsible to advise inhabitants that the area is totally safe. Certainly he would not want to expose himself, his family or his friends to these hazards of chemical pollution through lifetime residence there. There is in addition a measurable hazard in lifetime exposre to the polluted atmosphere of the city of Niagara Falls itself.

Table 1

COMPARISON OF MAXIMUM DETECTED CONCENTRATIONS OF KEY LOVE CANAL POLLUTANTS WITH SAFETY STANDARDS

maximum values

Love Canal Area

	AIR		WATER	TLV	Suggested no-adverse effect level H_2O 2/
	g/m^3 Love Canal	Niagara Falls	ppb Love Canal	µg/m^3 1/	ppb
tetrachlorodibenzo-p-dioxin*			(5.1)		0.0007
hexachlorocyclopentadiene*				100	
hexachlorobutadiene	(114)	0.41		240	
pentachlorophenol				1500	21
2,4,5-trichlorophenol			734		5.25
γ-hexachlorocyclohexane			17 (50)	500	7
hexachlorobenzene*					7
pentachlorobenzene	(500)				
pentachloronitrobenzene*					7
tetrachlorobenzene	(74)	9.6	120 (5000)	670,000	
trichlorobenzenes	(84)	43.7	190 (52)	40,000	
p-dichlorobenzene			190	450,000	93.8
o-dichlorobenzene	(100)	100	130	300,000	
o-chlorotoluene	(7650)	226	2700	250,000	
chlorobenzene	(172)		(10)	350,000	

1/ American Conference of Government Industrial Hygienists (1980).

2/ National Academy of Sciences (1977) Drinking water and health.

* Suspect carcinogen.

Figures in ( ) Kim, C. S., R. Narang, A. Richards, K. Aldous, P. O'Keefe, R. Smith, D. Hilker, B. Bash, J. Stack, D. W. Owen "Love Canal" Chemical Contamination and Migration Oct. 15-17 (1980).

Table 2

POLLUTANT ANALYSIS LOVE CANAL AND ADJACENT AREAS OF NIAGARA FALLS, NEW YORK

STORM SEWER SEDIMENTS

pollutant	maximum concentration - ppb map area 11 (Love Canal)	2 (W)	3 (W)	4 (N)	6 (E)	8 (E)	99 (control)
tetrachloro-p-dioxin	9570	5.4		672	0.50	0.40	
hexachlorocyclopentadiene	260						
hexachlorobutadiene	109100						
pentachlorophenol							
tetrachlorophenols							
trichlorophenols	495900						
dichlorophenols							
γ-hexachlorocyclohexane	440000	79	21	20000			
hexachlorobenzene	63100			15700			
pentachloronitrobenzene							
tetrachlorobenzenes	468600		3590	1700			
trichlorobenzenes	457700	1300	490	4100		250	
dichlorobenzenes	680700	305		3900			
chlorobenzenes							
chlorotoluenes							

Table 3

POLLUTANT ANALYSIS LOVE CANAL AND ADJACENT AREAS OF NIAGARA FALLS, NEW YORK

SOIL

pollutant	maximum concentration - ppb map area 11 (Love Canal)	2 (W)	3 (W)	4 (N)	6 (E)	8 (E)	99 (control)
tetrachloro-*p*-dioxin							
hexachlorocyclopentadiene							
hexachlorobutadiene							
pentachlorophenol							
tetrachlorophenols							
trichlorophenols							
dichlorophenols							
γ-hexachlorocyclohexane	407			9			
hexachlorobenzene							
pentachloronitrobenzene							
tetrachlorobenzenes	10485						
trichlorobenzenes	247						
dichlorobenzenes	2642	316					
chlorobenzenes							
chlorotoluenes	377						

Table 4

POLLUTANT ANALYSIS LOVE CANAL AND ADJACENT AREAS OF NIAGARA FALLS, NEW YORK

WATER - SUMP

pollutant	maximum concentration - ppb map area 11 (Love Canal)	2 (W)	3 (W)	4 (N)	6 (E)	8 (E)	99 (control)
tetrachloro-p-dioxin	0.6						
hexachlorocyclopentadiene							
hexachlorobutadiene	710						
pentachlorophenol		14					
tetrachlorophenols							
trichlorophenols	30						
dichlorophenols	8500						
γ-hexachlorocyclohexane	2000						
hexachlorobenzene	230						
pentachloronitrobenzene							
tetrachlorobenzenes	1300						
trichlorobenzenes	4500						
dichlorobenzenes	1340						
chlorobenzenes	2800						
chlorotoluenes	7600						

Table 5

POLLUTANT ANALYSIS LOVE CANAL AND ADJACENT AREAS OF NIAGARA FALLS, NEW YORK

WATER - SHALLOW WELLS

pollutant	maximum concentration - ppb map area 11 (Love Canal)	2 (W)	3 (W)	4 (N)	6 (E)	8 (E)	99 (control)
tetrachloro-p-dioxin							
hexachlorocyclopentadiene							
hexachlorobutadiene							
pentachlorophenol							
tetrachlorophenols	734						
trichlorophenols							
dichlorophenols	507						
γ-hexachlorocyclohexane	17						
hexachlorobenzene							0.01
pentachloronitrobenzene							
tetrachlorobenzenes	135						
trichlorobenzenes	190						
dichlorobenzenes	320						
chlorobenzenes	193						
chlorotoluenes	6650						

Table 6

POLLUTANT ANALYSIS LOVE CANAL AND ADJACENT AREAS OF NIAGARA FALLS, NEW YORK

WATER - STORM AND SANITARY SEWERS

pollutant	maximum concentration - ppb map area 11 (Love Canal)	2 (W)	3 (W)	4 (N)	6 (E)	8 (E)	99 (control)
tetrachloro-p-dioxin		5.4					
hexachlorocyclopentadiene						86	
hexachlorobutadiene	120						
pentachlorophenol							
tetrachlorophenols							
trichlorophenols							
dichlorophenols	11						
γ-hexachlorocyclohexane		79		3.4		5.3	
hexachlorobenzene	239						
pentachloronitrobenzene							
tetrachlorobenzenes				87		379	
trichlorobenzenes		1300		41.6		228	
dichlorobenzenes		305		1.3			
chlorobenzenes		61					
chlorotoluenes				94		13	

Table 7

POLLUTANT ANALYSIS LOVE CANAL AND ADJACENT AREAS OF NIAGARA FALLS, NEW YORK

AIR - LIVING AREAS

pollutant	maximum concentration - ppb map area						
	11 (Love Canal)	2 (W)	3 (W)	4 (N)	6 (E)	8 (E)	99 (control)
tetrachloro-*p*-dioxin							
hexachlorocyclopentadiene							
hexachlorobutadiene							
pentachlorophenol							
tetrachlorophenols							
trichlorophenols							
dichlorophenols							
γ-hexachlorocyclohexane				0.098			
hexachlorobenzene							
pentachloronitrobenzene							
tetrachlorobenzenes				0.41			
trichlorobenzenes							
dichlorobenzenes	5.58	40.72	43.27	23.72	15.30	89.88	3.52
chlorobenzenes	3.15					3.26	
chlorotoluenes	6.47	8.72	6.22	7.23	6.74	8.54	5.76

JOHN SPELLMAN
Governor

ALAN J. GIBBS
Secretary

STATE OF WASHINGTON
DEPARTMENT OF SOCIAL AND HEALTH SERVICES
Olympia, Washington 98504

August 17, 1981

Clark W. Heath, Jr., M.D.
Director, Chronic Diseases Division
Center for Environmental Health
Centers for Disease Control
Atlanta, Georgia 30333

Dear Dr. Heath:

Before giving formal responses to the questions you pose about the Love Canal dump site, I would like to have the EPA raw sampling data summarized and interpreted as in the format of a scientific article.

I have come to some preliminary conclusions after perusing the raw data, reading the available published studies, and listening to the presentations and discussion at the Atlanta meeting.

Since the EPA sampling was done in August-October 1980, one year after the site had been capped, these samples represent historical remnants of Love Canal pollutants.

It is currently impossible to reconstruct the pollution situation at earlier times. Thanks to the nature of the soil and terrain, most of the pollutants dumped in the Canal did not migrate very far. The only exception to this is the contamination of storm sewers, catchment basins, waterways and streams draining Ring I homes. The capping of the Canal and the installation of the barrier drain system and treatment plant seem to be working to prevent further pollution.

With the exception of the anecdotal reports of gross contamination of a dozen Ring I and II houses, and sampling results adjacent to sand lenses, there is surprisingly little objective evidence that serious chemical pollution of the environment occurred. There is currently no good evidence that this pollution has caused human health impairment. The pollutant levels measured are far below those causing acute effects and probably could not be linked to chronic health effects if, indeed, such effects were demonstrated.

The EPA sampling effort was extensive and seems to be state of the art.

If the integrity of the clay cap and covering turf can be maintained and the barrier drain system properly operated, I see no reason why the area cannot be rehabilitated. With the exception of the dozen or so obviously contaminated houses, I'd go as far as having no objection to the other houses in the area being reoccupied.

When the summarized EPA sampling data are available, I'd like to see them.

Thanks for giving me the opportunity to offer advice.

Sincerely,

Sam Milham

Samuel Milham, Jr., M.D.
Head, Epidemiology Section LB-15
Health Services Division

SM:em

CIIT

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August 18, 1981

Clark W. Heath, Jr., M.D.
Director, Chronic Disease Division
Center for Environmental Health
Center for Disease Control
Atlanta, GA 30333

Dear Dr. Heath:

Given the heterogeneity of the group who reviewed the EPA monitoring data, it is clear that there will not be a consensus concerning what these data mean relative to a health risk to the residents of the Love Canal area. I think it is quite clear that the analytical data was generated in as scientifically a rigorous manner as is possible. All of the analytical chemists present at the meeting were of that opinion, including Stephen Kim of the New York State Department of Health. The validity of these analytical data is also suggested by their general concordance with the data generated earlier by the New York Department of Health. Some of the panel members had difficulty evaluating the EPA analytical data in the form in which they were presented. I had less difficulty in that regard, primarily because I had spent considerable time comparing the data from the various sampling regions of the declaration area with the control data. It is my opinion that, with the exception of the canal area itself (including some ring one houses), the analytical data do not indicate that residents of the declaration area are exposed to levels of chemicals by way of air, water or soil which are, in a practical sense, different than exposure, by those same routes, of people living in the control areas. It is also highly unlikely since they are, in general, much lower than allowable concentrations in the industrial work environment, that persons in the control areas are experiencing any significant health risk from exposure to the levels of various chemicals detected in the EPA monitoring. It can be argued that persons in the declaration area are exposed to toxic chemicals, as a result of their presence in the Love Canal, which were not monitored for by the New York Department of Health or EPA. However, I do not believe that argument has any merit in a practical sense. The EPA monitoring examined for compounds of known and unknown toxicity which they knew had been disposed of in the Love Canal. Unquestionably, there are compounds in the Love Canal which were not examined for in the EPA monitoring and for which there is no toxicology data base. However, unless these compounds posses considerable volatility, the persons in the declaration area are not likely to be exposed to them. I say this because, with the exception of about 10% of the houses in ring one and the effluent of some storm sewers adjacent to the canal, there is no evidence of migration of chemicals from the immediate area of the canal. In addition, the human health monitoring or the animal studies which have been done on site have not yet produced any evidence of adverse health effects or the potential for adverse health effects in residents of the declaration area. I repeat that it can, and has been, argued that persons living in the declaration area may be exposed to chemicals which have not yet been identified in the monitoring program. It is further argued that these chemicals may have an adverse health effect. My answer to this is that there comes a time when we must stop delaying decisions relative to the health risks to persons in the declaration area based on unknown and improbable eventualities. I believe the time for decision making in this regard has come. Based on the analytical data, the results of human health monitoring and on-site animal studies it is my opinion that no practical health risk exists for persons living in the declaration area (excluding the immediate area of the canal and ring one houses). The finding of low birth weight children in the "wet" vs. "dry" areas of the declaration area is offered as an argument that adverse health effects are occurring. I do not find these data at all convincing. First of all, the numbers are small. Secondly, there is no evidence that there was movement of chemicals from the canal into these areas. Finally, the fact that the incidence of low birth weight babies of families living in ring one and ring two houses was not significantly different from control incidences suggest the effect seen in the "wet" area is either a spurious result or unrelated to living in close proximity to Love Canal.

With those general comments as a background, let me direct some remarks to the specific questions you posed in your letter of August 6.

Question 1

As I indicated above, the raw data from the EPA analytical monitoring does not suggest that the compounds which were monitored for were in higher concentrations in the declaration as compared to the control areas of Niagara Falls (excluding some ring one houses and the immediate area of the canal).

Question 2

Again, as noted above, the analytical data currently available do not indicate that persons living in the declaration area are exposed qualitatively or quantitatively to chemicals which are, in a practical sense, different from the exposure of people living in control areas of Niagara Falls.

Question 3

In my opinion, sufficient sampling for known substances of high toxicity have been performed. The results of this sampling do not suggest the presence of sufficient amounts of these substances in areas outside of some ring one houses and the immediate canal area, which pose a health risk to people living in these areas.

Question 4

In my opinion, people living outside of the ring one houses are not exposed to levels of the chemicals present in the Love Canal which pose any significant health risk. Further, the lack of significant migration of chemicals from the canal (excluding some ring one houses and storm sewers adjacent to the canal) in the 30 plus years of the presence of significant amounts of chemicals in the canal does not suggest the possibility of future exposure of persons living in the declaration area from chemicals present in the immediate area of the canal. The fact that additional safeguards against migration of chemicals from the canal by various routes, including storm sewers, have been put in place, adds additional assurance that significant migration is highly unlikely in the future.

Sincerely,

Robert A. Neal
President

RAN:eam

Review of EPA Monitoring Program at Love Canal
August 16, 1981
by Dr. Beverly Paigen

Summary

The consultants to CDC were asked to evaluate a subset of the data obtained by EPA's environmental chemical testing program and to answer the following questions:

1. Are the concentrations of chemicals significantly higher than other areas of Niagara Falls?
2. Could these concentrations cause adverse health effects?
3. Were enough samples taken of very toxic chemicals such as dioxin to be able to assess its health threat?
4. Is the area habitable?

The data had several problems in the presentation of material and in the adequacy of measurements. Putting these aside, I believe it was possible to judge that organic chemicals were higher in Love Canal study area (the entire Love Canal neighborhood excluding Rings 1 and 2) than in other areas of Niagara Falls. Organic chemicals were higher in storm sewers, in stream sediments, in sumps, in soil, and in home air. Only in drinking water were organic chemicals similar in Love Canal and control area and this is based on a small amount of data.

The data are not adequate to permit an answer to questions 2 and 4 regarding health and habitability for reasons discussed below. In answer to question 3, there were insufficient samples taken to adequately evaluate whether dioxin levels constitute a health threat in the study area even though the small number of samples had surprisingly high levels of dioxin.

Finally, additional analyses of data would be helpful in determining the extent of contamination at Love Canal and these are listed.

I. Adequacy of data

A. Problems for the consultants in reviewing data

The data were difficult to evaluate because of the massive amount of data, the short time to review, the lack of statistical treatment, the inability to read some tables and maps, and the lack of sufficient summary tables and paragraphs. Although I can appreciate the difficulties in assembling and reproducing such large amounts of data, I am not comfortable as a scientist in answering questions concerning public health based on data I cannot read (pp 72-74, 76-78), data with obvious errors (maps on pp 62-70 show stream sediment samples taken where there is no stream), unexplained symbols on maps and tables, and little aggregation of data or statistical analysis (i.e., the entire second book of sampling areas has no summaries at all).

Several points were particularly disturbing. There was no description of control sites (i.e., Packard Avenue may be near another dump site). The EPA program was designed to test for preferential migration (p 8), yet there was no data analysis concerning that hypothesis. The separation into areas 1-11 had some rationale, but there is no discussion of this nor analysis by area.

The picture was further confused when Mr. Deegan of EPA, at the August 13 meeting of consultants, stated that, in his opinion, the data demonstrated no evidence of chemical contamination beyond Ring 1 except for storm sewers and stream sediments. When a consultant asked Mr. Deegan about the soil data on p 41, Deegan replied that table was "no longer operative." The consultant then spent the lunch hour tabulating data by hand from the larger data bases and indicated to Deegan that organic chemicals were frequently found in Love Canal and rarely in control area soils. Mr. Deegan claimed that the differences were "not statistically significant."

As a scientist asked to make a judgment based on data, I simply cannot in good conscience ignore tables of data simply because one person states they are no longer operative nor can I accept one person's statement that the differences are not statistically significant when I am not shown the statistical methods or significance tests and when the data available in hard copy to review lead to the opposite conclusion.

B. Problems with using the data base to answer questions concerning health and habitability

The original plan was to couple the environmental testing programs with a health study. Had that plan been carried out, the two studies taken together could have been used to answer questions of health and habitability. As it stands, the current data base is not appropriate to answer such questions for the following reasons:

1. Love Canal has over 200 chemicals present and only a subset were measured.

2. Little or nothing is known about the toxicology of a large percentage of the chemicals present because they are waste products or process intermediates (for a fuller discussion see Rall et al. "Report of Subcommittee to Evaluate Health Effects Near Hazardous Waste Sites." HHS 1980).

3. Little is known about the synergism or antagonism that might exist in such a complex mixture of chemicals.

4. Even for those chemicals that were measured and for which toxicological data exist, most studies are based on workers or experimental animals. Almost nothing is known concerning the concentrations of chemicals that would be safe for the human fetus, yet adverse reproductive outcomes were the health effect best documented at Love Canal.

The primary ways in which this particular data base could be used to answer questions of health and habitability are two-fold. First, if the levels of one particular chemical were high enough, one could state it was unsafe. Second, if one particular area showed no evidence of chemical contamination, then one could tentatively conclude the area was safe if the sampling was adequate and if the subset of chemicals measured are an adequate reflection of the whole set.

C. Problems with Quality Control

EPA had a good quality control plan for this study with spiked samples, duplicate samples, and inter- and intra-laboratory comparisons. The results of the quality control program are described on pp 111 and following. Several points were made by EPA.

1. The "meaning of trace is obscured by the variance in minimal detection limits among laboratories" (p 119). Trace from one lab could be 30 times higher than trace from another lab (i.e., see tetrachlorobenzene on p 130).

2. Some laboratories performed much better than others ranging from 33 percent acceptable results to 100 percent acceptable results (p 133). These two facts led to a cautionary statement that "users of Love Canal data should be aware of differences in detection limits .... and performance" among laboratories (p 120).

3. The magnitude of the testing program "literally overwhelmed the national capacity for low level chemical analysis" (p 121). Thus many samples were held too long and this fact becomes important for volatiles and semivolatiles. For water many samples arrived with poorly fitted or leaking Teflon cap liners (p 122). Water samples were held too long. Soil samples were held too long and the effect of holding was stated not to be a problem between 4-18 weeks but "losses in the first few weeks are indeterminable at this time" (p 142). For air holding time was not given in the summary data. Mr. Deegan referred the consultants to the full data base in Atlanta, but we could not find holding time there either. Holding time for volatiles in air is quite critical.

4. Some chemical measurements were not to be trusted, i.e., phthalates and methylene chloride in soil and benzene and toluene in air.

5. Reproducibility and accuracy of measurements for metals in soil and sediment were fairly good but were not good for volatiles and semivolatiles (p 148).

6. The reproducibility data for air was calculated in a way that is not familiar to me and which obscured the real differences (p 160). For example: if sample 1 has duplicates a and b and b is 50 percent higher than a; and sample 2 has duplicates a and b and b is 50 percent lower than a; I would calculate that the average difference between duplicate samples was 50%. EPA calculated that the average difference was 0 percent ($\frac{-50+50}{2} = 0$). I would like to see a more conventional analysis of reproducibility.

II. Tentative conclusions based on the data

The data base is not adequate to answer questions of health and habitability but there are several questions that can be answered or could havebeen answered by an environmental monitoring program. The conclusions are only tentative given the problems with presentation of material and quality of data base discussed under I above.

A. Is the Love Canal area contaminated?

The storm sewer, stream sediments, soil, sumps and air in homes in Love Canal are all clearly contaminated compared to the rest of Niagara Falls. Only the drinking water appears to be the same as the rest of Niagara Falls and that is based on very limited data.

EPA did not give any statistical analysis of the data so I examined the data for organic chemicals and simply asked whether each organic chemical was more frequently found in Love Canal samples than in control samples. I then used a simple statistical test, the sign test which has relatively low power, to ask the probability that, for example, out of 13 separate tests, Love Canal was higher than control 13 out of 13 times. This is given by $(1/2)^{13}$ or 0.0001, a significant difference. This is not a sophisticated analysis; it would be possible to use other tests that involve a combination of probabilities (such as Fischer or Wallis). In addition, a strong argument could be made for combining the chemicals into groups such as all trichlorophenols or all BHC or all organics.

For storm sewer sediments, there were 21 Love Canal area samples and 1 control and 14 organic chemicals gave positive readings. In 14/14 cases, Love Canal is higher than control (p 54). For storm sewer water, there were 9 Love Canal samples and 1 control and 13 organic chemicals were detected (p 55). Love Canal was higher than control in 13 out of 13 (12/13 controls were 0). In the sanitary sewers, only 1 Love Canal water sample was taken (no control samples). Twelve organic chemicals were found at levels comparable to or higher than storm sewer water (p 57).

The stream sediments in Love Canal were contaminated but the stream water did not show evidence of contamination. There were 4 Love Canal samples and 5 control samples. For the sediments, 12 out of 12 chemicals were higher in Love Canal; in the stream water only 2 organic chemicals were detected (toluene and heptochlor) and Love Canal was lower than control.

In the sumps, there were 105 Love Canal samples and 6 control area samples (p 51). Love Canal was higher in 9/9 cases (6/9 controls were 0).

In the soils, there were 113 Love Canal samples and 8 control samples (p 41). Love Canal soils were higher in 12/12 organic chemicals. All 12 control samples were 0.

In drinking water, there were 31 Love Canal samples and 5 control samples. A total of 7 organic chemicals were detected; Love Canal samples were higher in 3 and control samples were higher in 4. Thus there was no apparent difference in Love Canal and control, a result that is not surprising since the same municipal water is supplied to both areas.

The data given for shallow aquifer wells and deep aquifer wells was not sufficient to permit an evaluation.

There were over 100 Love Canal samples of outdoor air (p 72) and over 80 Love Canal samples of basement air (p 73). However, there were no controls and so one cannot determine whether Love Canal is different than Niagara Falls.

For living area air, there were over 400 Love Canal samples and 30 controls (p 74). After eliminating benzene and toluene based on information in the quality control section; 11 out of 12 organic chemicals were higher in Love Canal homes than in control homes. The exception is p dichlorobenzene, which is completely missing from the table on p 75 causing me to wonder if there is an error. All of the air data were difficult to evaluate because they were almost unreadable.

In conclusion the data show that Love Canal is clearly higher in organic chemical contamination than the control area in storm sewer, stream sediments, sumps, soils, and living area air. No determination could be made for sanitary sewers, basement air, or outside air since no control data exist. Drinking waster was the same for both Love Canal and control and indeed comes from the same municipal source. Surface water, surprisingly, did not show any evidence of contamination although the sediments did. Perhaps this is because organic chamicals would tend to stay in sediments or be released into air, but would not be dissolved in water.

B. How far has the contamination occurred?

Since the data indicate that Love Canal is contaminated, it becomes relevant to determine how far contamination has occurred. Unfortunately, no analysis by area was given. The areas of particular concern are 5 and 1 which are the extreme edges of the neighborhood and where the greatest percentage of current residents are located. Both areas 1 and 5 have a few houses on swales or streams and these appear to be giving quantifiable levels of chemicals. I would like to see an analysis with and without those houses.

C. By what routes did contamination occur?

No analyses were presented that would permit such a determination, but it may be possible. I would like to see an analysis by 1) area, 2) wet/dry, 3) swale/non-swale, and 4) air in home with and without sumps. Several homes in the area have flooding in the yard from storm sewers. Are the soils, air, or sumps higher in such homes? Is there any correlation between positive readings in soil and air or sumps in the home?

D. Has remedial work resulted in a reduction in contamination?

Mr. Deegan stated that back flushing of chemicals from the soil was occurring to a greater extent than expected. This is an important finding and I would like to see the data.

I would also like to see a comparison of homes done by both New York State and Love Canal to compare soil, air, and sumps.

E. Is there correspondence between the geochemical evidence of contamination and the adverse health effects?

The adverse reproductive outcomes found by New York State should be compared to the geochemical data.

III. Questions posed by CDC

A. Are the concentrations of chemicals significantly higher than in other areas of Niagara Falls?

As discussed above, the answer is yes.

B. Could these concentrations cause adverse health effects?

Due to the limitations of the data base discussed above, I do not believe this question can be answered.

C. Were enough samples taken of very toxic chemicals such as dioxin to be able to assess its health threat?

Only 4 soil samples in the study area were tested for dioxin and all 4 were negative. This is an insufficient number of samples. Eleven storm sewer sediment samples were taken and all had dioxin levels.

D. Is the area habitable?

As discussed above, I do not believe this particular data base permits an answer to that question.

However, as a parent of young children, I would not want to live in any Love Canal house that 1) was along a stream with contaminated sediments, 2) had a history of basement or yard flooding from backed up storm sewers, or 3) had a sump pump. Any of these situations could lead to periodic exposures much higher than those detected by the EPA monitoring programs.

IV. Further Analyses

The following information would be useful in a further evaluation of the data base.

1. Holding time for air.
2. Evaluation by area.
3. All positive readings for organic chemicals on a map by media and with various media combined.
4. List of organic chemicals not likely to be found in consumer products.
5. Map of control sites and other dumps in Niagara Falls.
6. Statistical evaluation of data.
7. Readable tables of data for air.
8. Analysis by wet/dry.
9. Correlation of chemical data with adverse reproductive outcomes.
10. Discussion of p dichlorobenzene--the only chemical found more often in control than in Love Canal.
11. Readable figures for daily variation in air readings.
12. Comparison of New York and EPA data for some locations.

V. Final questions

The most striking thing about the EPA monitoring program was the high percentage of negative findings and the low levels of chemicals found compared to New York data.

The question that comes to me is whether exposure at Love Canal is periodic in nature and whether the health impact may occur by transitory exposure to higher levels than those found by EPA. According to Vianna et al, the peak in adverse reproductive outcomes occurred in the mid-sixties when as many as 50 percent of all pregnancies on 99th Street ended in miscarriage. In the mid-sixties, basements were being dug for the homes on 97th Street. Perhaps the exposure of large amounts of contaminated soil to the air on 99th Street resulted in a transitory high exposure for residents on 99th Street and beyond. Consistent with this hypothesis is the peak of adverse reproductive outcomes claimed by the Love Canal residents during the remedial construction in 1979 and 1980. Perhaps Love Canal may be habitable as long as no digging occurs. Another peak exposure may have occurred following the unusually heavy precipitation in 1977. This exposure caused the residents to organize and to seek help and it was this type of exposure that the remedial work was designed to prevent.

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CHEMISTRY AND LIFE SCIENCES GROUP

August 27, 1981

Dr. Clark W. Heath, Jr.
Director, Chronic Diseases Division
Center for Health
Centers for Disease Control
1600 Clifton Road, N.E.
Atlanta, Georgia 30333

Dear Dr. Heath:

Enclosed is a copy of the review on the EPA Love Canal Study. I enjoyed the opportunity to provide some assistance to you in this program and hope that it will be helpful to the overall goals. If I can be of any further help please give me a call at (919)541-6579.

Sincerely,

E Pellizzari

E. D. Pellizzari, Ph.D.
Director for Analytical
Sciences Division

EDP/mlu

Enclosures (as stated)

(919) 541-6000 FROM RALEIGH, DURHAM AND CHAPEL HILL

REVIEW OF EPA LOVE CANAL STUDY

E. D. Pellizzari

Research Triangle Institute

Research Triangle Park, North Carolina

Introduction

The emphasis of this review was directed toward assessing the study design and analytical methodology employed for acquiring information concerning toxic chemicals in the various media. The primary questions to be addressed in the review were expanded to provide more in depth probes to the viability of the study design and results. These aspects are debated below.

Purpose of the Review

The major thrust of this review is to address the following primary questions:

(1) Were sufficient samples taken and analyzed to determine the extent of contamination by particularly hazardous materials and to be able to assess their potential threat to human health?

(2) Are the concentrations measured significantly different from levels found in other areas of Niagara Falls?

(3) Do the levels measured represent concentrations that could cause acute or chronic adverse health effects in people living in the Love Canal area beyond what might be expected under usual residential conditions in the Niagara Falls area?

(4) Based on available data is the area not habitable?

Specific Issues Reviewed

The primary interrogatives not only have far reaching ramifications but also contain subtle, detailed issues that need examination prior to drawing any valid conclusions. Some specific issues are enumerated and addressed here as part of this review.

(1) Was the study design adequately structured to meet the main objectives implicit in the primary questions?

Based upon readily accessible information the implied intention of the study was to determine whether a significantly greater risk of exposure to chemicals from the Love Canal site exists now or in the future for inhabitants of the declaration area as compared to inhabitants of other areas within Niagara Falls, NY. In essence the design should be a probability study. To demonstrate significant differences between a "test case" and a "control case" sufficient, representative, experimental data from both cases need to be acquired. The problem becomes predicting what is "sufficient" when initially setting up the study design. This is particularly difficult if the samples analyzed yield many non-detectable values. Probability functions can be used to decide upon "representative" data. Also, what constitutes significant, i.e., is the purpose to measure differences between the two areas that are greater than factor of two or an order of magnitude.

The monitoring of ambient air for volatile chemicals occurred at 62 sites in the declaration area and 4 sites in the "control" area over a two month period. Both outdoor and indoor (living room and basement) ambient air was sampled as

12 hr integrated samples (two/day). Unoccupied premises were sampled which had been closed to enhance the possibility of elevated levels of chemicals. Although sufficient numbers of samples were collected during the period of September and October, 1980 at each site, more sites designated in the "control" area would have been desirable, especially when testing for significant differences between the declaration and control area. The degree of representativeness of the four sites in Niagara as constituting a "control" might be questioned.

Monitoring of water was primarily through "grab" sampling instead of integration with time. Drinking water was obtained from pre- and post- municipal treatment systems serving the communities designated as the declaration and control areas. This is an indirect approach. Acquiring drinking water samples from each home selected for air monitoring may have revealed whether any small ruptures in water lines existed in contaminated areas. Nevertheless, the likelihood of such an occurence probably is small. Ground water was taken from about 170 wells, including shallow and deep aquifers from the declaration and control areas. In this case their were more sampling sites from the control area (15) than in the air sampling design. Water samples from storm sewars (28 sites), sumps in basements (54 sites) and creeks/rivers (19 sites: 14 declaration, 5 control) were also collected. The rationale for selection of sampling sites within each area was not clearly stated in the report provided, nor whether the objectives were achieved.

Sediments were collected from 19 streams, 3 sumps and 24 storm sewers. One sediment sample from the Leachate Treatment Facility was also taken. Soils were taken from 171 locations (9 in control area) as 6 ft. vertical cores.

The major exposure route is postulated to be ambient air, since vaporization of surface chemicals would lead to their inhalation. The importance of soil and sediment cannot be over emphasized since they can provide historical (time integrated) documentation of fate and transport of chemicals. The number of sediment samples examined probably are representative of the streams and sewers; however, an insufficient number of sumps were selected. Sediments from sumps in both occupied and unoccupied homes in the declaration area should have been included in the study, particularly since previous evidence is suggestive that major pollution of basement air came from the basements sumps.

Soil also can be a major route in "pica" exposure in young children. Moreover, it can be a sink for chemical emission (fallout) and subsequently involved in dynamics of transport. Vertical cores were not analyzed in sections. As such, considerable dilution could occur from such compositing to the extent that any chemicals potentially present as a small discrete zone (say at the ground surface) were diluted below the detection limits of the techniques employed.

(2) Was the most exhaustive list of toxic chemicals potentially occurring at Love Canal sought in the study design?

The selection of methods for sampling and analysis of air, water, soil, sediment and biota obviously should be based upon the best available technology. The techniques employed, however, essentially limited the study design to a finite list of target compounds. One should be cognizant of the fact that comprehensive monitoring for all chemicals in the five matrices was not conducted nor is it possible with the current analytical methods in the analyst's arsenal of tools. This may be inappropriately gleaned as a serious limitation of this study. The technical approach employed emphasized quantification of target compounds. Nevertheless, an equally important aspect should have been the determination of any "unknown" chemicals that may be present. The qualitative identification of as many chemicals as possible with state-of-the-art technology would increase ones confidence that the chance of potential exposure to toxic chemicals is minimal if the findings are not significant. This feature of the study was short changed since state-of-the-art technology (see below) was employed for only some of the environmental media.

(3) Were the sampling methods selected for the various environmental media - air, water, soil, biota, sediments - viable for the purposes intended to support the study design?

In as much as its possible to assess this facet of the study it appears that the sampling techniques employed were adequate. One minor exception on soils was noted above, however. More detailed discussion on the documentation of accuracy of sampling will be discussed under Quality Control/ Assurance (QC/QA) below.

(4) Were the analytical methods that were employed state-of-the-art?

The methods chosen for sampling and analysis of ambient air for toxic organic vapors were in this case state-of-the-art. Neither method (Tenax-GC/MS or Polyurethane foam - GC/ECD and HPLC/EC) is a "standard method". Also, the application of these complimentary methods still do not yield a comprehensive picture of the ambient air composition. The full potential of either method was not realized in this study. The Tenax-GC/MS method lends itself to assessing sampling accuracy by the use of deuterated surrogate chemicals. This feature was not exploited (To be discussed further under QC/QA). The polyurethane foam technique (PUF-GC/ECD) employed antiquated pack column gas chromatography. The use of capillary column technology would have improved the limits of detection for the target compounds (halogenated aromatics including PCBs and polychlorinated naphthalenes) as well as ensured more specificity to isomer identification and quantification. Thus, collection with polyurethane foam is at the frontier of the scientist's capability while packed column gas chromatographic analysis is at least a decade outdated.

Similar criticisms can be made of the use of the Federal Register Methods for analysis of water samples. The strength of these methods rests with the degree of validation (both intra and interlaboratory) that each has been subjected to over the past several years. Nevertheless, the use of selective detectors with gas chromatography is limited to quantification.

Broad spectrum analysis (identification of non-targeted chemicals) should have been given more emphasis to decrease the chances of missing important chemicals in this study. Capillary column GC/MS should have been employed rather than packed column technology, again to increase the accuracy of identification and the breadth of analysis capability.

Similar deficiencies can be cited for the methods employed for analysis of soils, sediments and biota.

(5) Were experienced and reliable research/service laboratories employed for the sampling and analysis of air, water, soil, sediment and biota?

Analysis of air samples were performed by two laboratories with no prior experience with the Tenax-GC/MS method. This was evident in the Quality Assurance sample results which appeared to be less precise during the first few weeks of analysis by one laboratory. Laboratories performing analysis using the PUF-GC/ECD method were experienced with the technique.

All other laboratories had several years prior experience in performing priority pollutant analysis in water samples and to a lesser extent in soil, sediment and biota.

(6) Were their sufficient Quality Control and Assurance practices imposed on the sampling, sample analysis, and data analysis to ensure the integrity of the analytical data reported?

The QC/QA practices employed were extensive and one of the relatively stronger features of this study. Unfortunately, "Standard Reference Materials" are not available from the National Bureau of Standards. Thus, reliance was on performance evaluation solutions, controls, blanks, etc., to assess the sample preparation and analysis steps.

Quality assurance applied to the sampling and storage step for each environmental matrix was limited to the use of spiked sampling devices (containers) for determining recovery (i.e., accuracy). No internal standards were used to assess potential malfunctions of the sampling step and subsequently storage, work-up and analysis. This is a serious limitation of all methods. A small percentage (~ 10%) of the samples should have included internal standards during sampling. For example, deuterated benzene (d_6), d_5-chlorobenzene, etc., could have been added to the ambient air sampling device (protocol: Tenax-GC/MS) to monitor the accuracy of sampling and analysis without interfering with endogeneous chemical analysis. The use of isotopic compounds would more closely mimic the endogeneous compounds than the use of spiked, unsampled devices. The isotopic concept is well documented and widely accepted by analytical chemists in many different areas of research.

Much of the QC/QA practices were devoted to establishing precision. As such criteria were used to establish "out-of-control" guidelines. This aspect of the study is well done and substantially documented. Somewhat disappointing were the number of data points classified as out-of-control and thus not usable. Storage times exceeded recommended maximum holding times for water, soil, and sediment. This may have accounted for the high rejection level. More important, a substantial quantity of data for water samples could not be accounted for (by this reviewer) on the basis of samples collected. This problem needs to be clearly rectified.

(7) Is the overall quality of the data adequate to support the study objectives?

For the most part the precision of this data appears to be plus or minus a factor of two (2 σ) for the sampling and analysis techniques employed for each environmental medium except soil which is somewhat larger. To determine whether a significant difference exists between the declaration and control areas this level of precision can be one of the limiting factors. The accuracy for each S/A method is more difficult to discern, in fact no definitive statement should be made since internal standards were not employed as surrogates.

(8) Does the data appear to be consistant across all environmental media studied?

An estimated 90% of the 400,000 measurements performed yielded results below the detectable limits of each method. This is the most important observation to be cited of the data, i.e., its consistency across all environmental media. Such overwhelming negative evidence suggests that the conclusions to be drawn will be substantially founded. It is highly improbable that all S/A methods employed were inferior and incapable of detecting the target chemicals if present.

(9) Does the data provide any insight to significant differences between the declaration and control areas?

Even though the statistical frequency tests between the two areas are not significant, the sample size employed in the control area may have been too small since the number of values reported below the detection limits was large (possibly skewed data).

Conclusions

The following responses are offerred to the primary questions raised concerning this study:

(1) More sites representative of the "control" area in Niagara Falls should have been selected in this study for making comparisons to the declaration area.

(2) Data available for review did not indicate that significant differences in concentrations of the target compounds between the declaration area and other areas of Niagara Falls; however, this conclusions is subject to the qualifications cited in (1).

(3) If a clustering health effect phenomenon was presently latent in the declaration area it is not clear how the statistical design of this study would have detected this possibility. The results of this study design suggest at best the minor differences in concentrations between the declaration and control area would have to cause acute or chronic adverse health effects at an elevated rate in the Love Canal area relative to Niagara Falls.

(4) Based on the available data from this study design the area appears to be habitable. More importantly, the data should be reanalyzed to determine whether any one household might be considered at a greater risk (risk assessment analysis) rather than comparing statistical means, medians, geometric means between the two areas and extrapolating potential risk to the entire area. Perhaps each location (household) in the declaration area should be individually evaluated.

Finally, this reviewer strongly recommends that the Final Report on the Love Canal be written in acceptable scientific format with one additional peer review of the report prior to its release. In its present form it is unacceptable for release.

NATIONAL RESEARCH COUNCIL
ASSEMBLY OF LIFE SCIENCES
2101 Constitution Avenue Washington, D. C. 20418

EXECUTIVE DIRECTOR
BOARD ON TOXICOLOGY AND
ENVIRONMENTAL HEALTH HAZARDS

August 26, 1981

Clark W. Heath, Jr., M.D.
Director, Chronic Diseases
Division
Center for Environmental Health
Centers for Disease Control
Atlanta, GA 30333

Dear Dr. Heath:

I am responding to your letter of August 6th requesting review of monitoring data from the Love Canal. I have reviewed the entire package of data and offer my conclusions in the format stated in your letter:

1. Are the concentrations measured significantly different from levels found in other areas of Niagara Falls?

The data indicate that the concentrations of some organic and inorganic substances are higher in the soil and sewer sediment in the Love Canal area than in other areas of Niagara Falls. However, for purposes of assessing risks to human health, it is unclear from these data whether human exposure is significantly different from one population to the other.

2. Do the levels measured represent concentrations that could cause acute or chronic adverse health effects in people living in the Love Canal area?

The levels measured in the various media would not be expected to produce acute toxicity unless, for example, large quantities of contaminated soil would be consumed (an unlikely prospect). On the other hand, the risk of chronic injury is real for exposure to the carcinogens and mutagens because the risks are assumed to have no measureable population threshold. The risks from these substances are associated not only with concentration level but also with duration of exposure. Since there is no longitudinal information about exposure, risk estimation is necessarily uncertain.

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3. Were sufficient samples taken and analyzed to determine the extent of contamination by particularly hazardous materials and to be able to assess their potential threat to human health?

There is little doubt that the sampling was exhaustive geopgraphically and that all media were analyzed extensively. These data provide an adequate picture of contamination in the area at the time of sampling. However, to assess risks to human health, two assumptions are required: First, the concentrations in media such as soil represent a measure of exposure of humans (for sewer sediment this is difficult to conceptualize); and second, the exposure presently assumed will continue for a large portion of the lifespan of the residents (longitudinal data would be advisable to address this issue). While perhaps impractical, data from actual human exposures would be the most reliable to make assessments of risks to human health. If those direct exposure data were available, an exposure algorithm could be constructed to estimate total body burden. This information could then be used to estimate risk.

4. Based on available data, can the area be considered "not habitable?"

From these data, I would conclude that some form of clean-up or containment is required so as to minimize possible exposure from, for example, contaminated soils. However from these data alone it is not possible for me to conclude that health hazards of such unusual proportions exist to make this area "uninhabitable." There are societal and legal considerations that must be taken into account in judging habitability.

I appreciate the opportunity to respond to your request.

Sincerely yours,

Robert G. Tardiff

Robert G. Tardiff, Ph.D.
Executive Director

HARVARD UNIVERSITY
SCHOOL OF PUBLIC HEALTH

JAMES L. WHITTENBERGER, M.D.
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665 HUNTINGTON AVENUE
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August 19, 1981

Clark W. Heath, Jr., M.D.
Director, Chronic Diseases Division
Center for Environmental Health
Centers for Disease Control
Atlanta, GA 30333

Dear Clark:

Before attempting to answer the questions posed in your letter of August 6, 1981, I wish to comment in general about the meeting and about the materials provided to the consultants. Overall it was one of the more frustrating experiences I've had as a consultant. On trying to read the draft report prior to the meeting, I found so many graphs and tables that were illegible or uninterpretable that I gave up trying to form any conclusions from the submitted material.

It would have been very helpful to have had in advance some of the comparison tables that some of us tried to construct for ourselves by searching through the printout during the meeting. For example, I thought it would be interesting to compare one air pollutant measurement in the living areas of the homes sampled in each of the geographic areas studied. Eventually I had a simple table showing that the chemical was present in all geographic areas except for the control area. It was annoying to be told repeatedly, in answer to questions, that "the data are all there on the table for you to examine." I was informed later that EPA had made additional comparison tabulations which had not been accepted by CDC. If this is true, I wonder about the reasons. I can respond better if I have a scientific presentation in essentially the form presented for publication in a peer-reviewed journal - the objectives, a statement of hypotheses to be tested, the study design, the methods in detail, including sampling strategy, the results, and the author's interpretations. I don't accept the author's interpretations unless he has persuaded me that he has used the best possible methods and analysis. I had the feeling that most such information came out piece-meal at the meeting, and we would have had a more fruitful day if these issues had been presented clearly at the beginning, or if we had had better information in advance.

On Page 17 of the EPA report is reference to "two comparison volumes." These were never identified so far as I know, although they contain data for Area 97, which is an interesting comparison area in some of the tables. The air monitoring data for Area 98 might also be of interest.

Whatever additional comments I have about the study will come in my attempts to answer the questions.

Question 1: Are the concentrations measured significantly different from levels found in other areas of Niagara Falls?

The more I reflect on this question, the more I wonder what it means. If taken literally, the answer is no, because many of the "concentrations measured" were found in "other areas of Niagara Falls." Presumably the intent was to compare either Area 11 (the Canal) or the Declaration Area (Areas 1 through 10), with the "control area" (Area 99). Since Niagara Falls has so many hazardous waste dumps, active or inactive, and since the control areas were defined in terms of proximity to known dump sites, the concept of "control area" is questionable in Niagara Falls, since dissemination or translocation of chemicals from dump sites is certain to have occurred by various construction activities as well as by natural processes. There are high concentrations of inorganics in sampling sites in many parts of Niagara Falls, including metals like arsenic, lead, mercury, and cadmium. My conclusion is that the Study Area (which does not include Area 11), is not significantly different from other areas of Niagara Falls, provided that one takes into account that storm sewers and outfall sediments can have high concentrations of contaminants from Love Canal.

2. Do the levels measured represent concentrations that could cause acute or chronic adverse health effects in people living in the Love Canal area beyond what might be expected under usual residential conditions in the Niagara Falls area?

Again, I assume the question refers to the Study Area, excluding Area 11. Considering contamination of air in living area and contamination of drinking water, I think residents of the Study Area are not at greater risk than might be expected under usual residential conditions in Niagara Falls.

3. Were sufficient samples taken and analyzed to determine the extent of contamination by particularly hazardous materials and to be able to assess their potential threat to human health?

As noted at the meeting on August 13, 1981, the sampling and analytical methods used by EPA and its subcontractors were "state of the art" and probably as well carried out as is possible in a study of this magnitude and complexity. EPA has been very sensitive to quality control issues since their problems with CHESS (a large program of epidemiologic studies of air pollution several years ago) and their problems with pesticide testing; I believe they took quality control measures seriously in this study and did as well as anyone could do considering the number of subcontractors and the state of development of specific methods. I think sufficient samples were taken except possibly for the control area. Only four houses had air sampling because it was so difficult to persuade occupants to vacate their houses for 3 months. If the data were consistent for a given house sampled repeatedly, for a week, for example, it might have been better to have more houses sampled for much briefer periods. However, I don't see this as a strong criticism of the EPA study.

4. Based on available data, can you conclude that the area is not habitable?

I assume again that we are talking about residential areas outside the rings of houses that were largely evacuated in 1978, and assume further that remedial measures will be continued to prevent further dissemination of chemicals still retained in the Canal, or previously deposited in storm sewers or outfalls.

Under these assumptions, I believe residence in the Study Area would be no more hazardous than in other residential areas of Niagara Falls.

In summary, I think EPA has done a very good study under difficult circumstances. In my opinion, the study is an adequate basis for judging the habitability of the areas neighboring Love Canal. Unfortunately, the findings are not directly relevant to assessment of human exposures pre-1978, since the study was performed after remediation. I believe that neighborhoods 200 ft. or more from the old Canal are just as habitable as other residential areas in Niagara Falls, provided remedial measures are continued, to contain the residual hazardous wastes.

Sincerely,

James L. Whittenberger

James L. Whittenberger, M.D.

JLW:mc

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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NEW YORK NEW YORK 10278

JUN 2 9 1982

Dr. Clark W. Heath
Director, Chronic Diseases Division
Center for Disease Control
Department of Health & Human Services
1600 Clifton Road, N.E.
Atlanta, Georgia 30333

Dear Dr. Clark:

I have received Dr. Brandt's June 15, 1982 letter concerning the Department of Health & Human Services' (HHS) review of the Environmental Protection Agency's (EPA) Love Canal report. That letter indicates you have relied heavily on the National Bureau of Standard's (NBS) review in reaching your conclusions. The Love Canal report has been modified to answer the key questions raised by NBS and to clarify the description of the quality assurance and quality control program and results.

Before HHS makes its final decision concerning their evaluation of the Love Canal report, I would appreciate your reviewing the final text. You should consider not only the issues raised by NBS, but the physical and chemical properties of the chemicals and the knowledge accumulated to date concerning how these substances migrate. Based on collected Love Canal data and the "property" factors, EPA has concluded that, except for the storm sewers, there are no chemicals in the Declaration Area attributable to migration from Love Canal, and that the frequency of occurrence and concentration of chemicals detected in the Declaration area is no different than the rest of Niagara Falls.

As you are aware, it is NBS's contention that detection limits and precision and accuracy should be specified before samples are analyzed. It is EPA's experience that such specificity is not possible given the present state-of-the-art in GC-MS organic chemical analytical methods.

NBS also is of the opinion that all reported measurement results should be accompanied by detection limits and precision and accuracy estimations derived from field samples. EPA agrees that it is preferrable, where possible, to provide method detection limits (MDLs) and precision and accuracy estimates for every chemical measured. As part of the Love Canal study, measured MDLs and precision and accuracy estimates were derived for 38 organic chemicals and 16 inorganic chemicals out of the approximately 150 compounds that were measured (see Appendices C, D and E of the Love Canal Report).

In the professional judgment of EPA scientists, it is reasonable to assume that the MDLs and precision and accuracy of the approximately 95 other organic chemicals are similar to the 38 for which we have values. (See Table I.) EPA does not claim that there is field or laboratory data that supports this judgment and, clearly, it would be preferrable to have additional information of this type, but we do not believe that it is essential.

Again as a practical matter, such information is generally not obtained, either in other studies or tests performed by EPA, analyses performed by other Federal agencies, including the Food and Drug Administration, and private industry. EPA believes that although the quality control and quality assurance performed during the Love Canal study was neither perfect nor the stringent ideal specified by NBS, it was acceptable and generally more detailed than most field studies where trace levels of organic chemicals are analyzed.

As mentioned above, EPA did perform the kind of MDL and precision and accuracy estimates suggested by NBS on 38 organic chemicals. Also, it is important to note that since the Love Canal study EPA's EMSL Laboratory, Cinn., has developed single laboratory MDLs for the "other" 95 organic compounds. Thus, we do have a data base which can assist us in decision making. The physical and chemical properties of the 38 chemicals includes those which are most mobile (e.g. benzene, chlorobenzene, and toluene) and which are relatively soluble in water and moderately to highly volatile. Other chemicals adsorb to soil and are less mobile (e.g. & BHC, PCB 1242 and dioxin) and have low solubility and are highly adsorptive. Of course, the metals also have different physical and chemical characteristics that can act as effective tracers of many of the inorganic chemicals. Since the MDLs and precision and accuracy are known for these inorganics, definitive conclusions can be drawn about how far they have migrated from Love Canal. It is our opinion that the available organic and inorganic data demonstrate that chemicals have not migrated beyond the fenced-in area, except through the storm sewers.

Further evidence of this characteristic migration pattern of organic chemicals is supported by a review of the literature. Enclosed are a few of the articles which document this pattern.

In summary, the data from Love Canal, the literature and EPA's experience at other hazardous waste landfills indicate that chemicals did not migrate past the first ring of homes. Given this conclusion, it is essentially irrelevant whether there is less confidence in the meaning of "none detected" for the 95 other organic chemicals in the Declaration Area. Also, it is important to point out that the procedure for determining the method detection limit, which is set forth in Environmental Sciences and Technology, Volume 15, Number 12, December, 1981, pages 1426-35, provides a high degree of assurance that positive identifications are real identifications. Under this procedure the probability is less than 1% that a value reported as "none detected" (which includes both trace and below detectable values) is, in fact, a value greater than twice the method detection limit. This represents the worst case situation.

As you know, EPA is planning on releasing its report on or before July 14, 1982; therefore, I would appreciate your final response concerning our position.

Sincerely yours,

Richard T. Dewling, Ph.D.
Deputy Regional Administrator

UNITED STATES DEPARTMENT OF COMMERCE
National Bureau of Standards
Washington, D.C. 20234
OFFICE OF THE DIRECTOR

JUL 8 1982

Dr. Richard T. Dewling
Deputy Regional Administrator
Environmental Protection Agency
Room 900
New York, New York 10278

Dear Dr. Dewling:

As requested on July 8, 1982, in a meeting of representatives of the Environmental Protection Agency (EPA), the Centers for Disease Control (CDC) of Health and Human Services, the Department of Justice (DoJ), and the National Bureau of Standards (NBS), I am providing written comments on the NBS review of the Analysis for Organic Chemicals in the EPA Love Canal Monitoring Study. These comments are based on an extensive NBS review of documentation on this subject provided to NBS by EPA from August 18, 1981 through February 17, 1982, and a limited review of the approach to setting method detection limits described in Appendix C, "Limits of Detection/Quantitation," Volume 1 of the final report.

Additional NBS comments are intended to supplement but not replace the NBS review and are appropriate for two reasons:

- EPA provided to NBS on June 28, 1982, additional information on limits of detection for the water analysis program in a revised Appendix C of their final report.
- CDC is having difficulty interpreting the significance of the NBS review. The NBS review was aimed in part at helping EPA to adequately document numerical data over the full range of concentrations measured (parts per billion range and above). CDC has indicated that their concerns are with concentrations in the parts per million range and above.

As I stated to you and CDC, the methods of analysis used by EPA for water, soil and sediments and air are generally acceptable methods and represent the state of the art. As we stated in our review, although there are difficulties in implementation, the number, nature and frequency of analysis of quality assurance samples specified by EPA should have been adequate to maintain quality control.

Most of the recent discussion between EPA, CDC and NBS has centered on limits of detection for the soil and sediments, air and water analysis programs. As EPA clearly recognized in their report, they were not able to establish limits of detection for soils and sediments. With respect to the limits of detection for the air program, EPA established and presented limits of quantitation for targeted compounds and limits of detection were determined by the participating laboratories. The documentation of the performance of the air monitoring laboratories is generally acceptable. The exception to this statement is the problems that arose from TENAX contamination that are discussed in the EPA report and the NBS review.

In order to respond to NBS concerns, raised in its review, on minimum detection limits for the water analysis program, EPA has presented an approach based on method detection limits. It is the assessment of NBS that this is a reasonable approach. In our view, the method detection limits obtained from this approach can be used for data analysis requiring minimum detection limits. We have three provisos to make with respect to our opinion.

(1) EPA should present the raw data and the chain of logic used to arrive at the method detection limits appropriate to each laboratory doing analysis.
(2) EPA should compute the actual minimum levels of detection for the measurements as made in the laboratories. That is, they should replace the "zeros" and "traces" in their data with "not more thans".
(3) EPA should demonstrate that the 38 compounds for which method detection limits have been stated are representative of the targeted compounds for the Love Canal water samples.

CDC has asked if NBS can certify the data contained in the EPA report. NBS cannot. Our comments pertain to the procedures and methods used by EPA. The data, as is true with any technical report, are the responsibility of the authors—in this case EPA. Representatives of EPA indicated in the meeting that, using an approach that NBS assesses as reasonable, EPA will provide data to CDC on minimum detection limits for the water analysis program.

You and CDC have asked if NBS endorses the statement that the NBS review did not identify any problems that would affect the conclusions of the monitoring program. NBS cannot comment on the significance of the problems that NBS has identified to the conclusions of the EPA report because such an evaluation requires knowledge of health effects and mechanisms of chemical migration and degradation in addition to knowledge of chemical analysis. NBS is knowledgeable of chemical analysis only.

If I understand the thrust of recent questions, both EPA and CDC are looking to NBS for a general characterization of the EPA study rather than the comments on particular issues to which we in our review have confined ourselves in accordance to the original assignment from EPA. NBS is not able to provide a general characterization of the EPA study because there are not quantitative statements of the precision, accuracy and minimum detection limits for data requirements for the study. In the absence of such a quantitative statement, general characterizations will have to come from the experts drawing conclusions from the study—namely, EPA and CDC.

Sincerely,

RG Kam

Raymond G. Kammer
Deputy Director